Cisco Nexus 5000 Series Hardware Installation Guide

For the Cisco Nexus 5000 Platform Switches and
the Cisco Nexus 5500 Platform Switches

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• Move the equipment farther away from the television or radio.

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Preface

This preface describes the audience, organization, and conventions of the *Cisco Nexus 5000 Series Hardware Installation Guide*. It also provides information on how to obtain related documentation.

Audience

To use this installation guide, you must be familiar with electronic circuitry and wiring practices and preferably be an electronic or electromechanical technician.

Organization

This guide is organized as follows:

Chapter and Title	Description
Chapter 1, "Overview"	Provides an overview of the Cisco Nexus 5000 Platform switches and the Cisco Nexus 5500 Platform switches.
Chapter 2, "Installing the Cisco Nexus 5000 Series Switches"	Describes how to install the Cisco Nexus 5000 Platform switches and the Cisco Nexus 5000 Platform switches, and how to install modules, power supplies, and fan assemblies.
Chapter 4, "Connecting the Switch"	Describes how to connect the Cisco Nexus 5000 Series switches to the Internet
Appendix A, "Cabinet and Rack Installation"	Provides guidelines for selecting an enclosed cabinet, the procedure for installing a switch using the optional and EIA Shelf Bracket Kit.
Appendix B, "Technical Specifications"	Lists specifications for the Cisco Nexus 5500 Platform switches and the Cisco Nexus 5000 Platform switches and components including modules, power supplies, and transceivers.
Appendix C, "Cable and Port Specifications"	Lists cable and port specifications for the Cisco Nexus 5500 Platform switches and the Cisco Nexus 5000 Platform switches.
Appendix D, "Site Planning and Maintenance Records"	Provides site planning and maintenance records.
Appendix E, "Troubleshooting Hardware Components"	Provides installation troubleshooting information for the Cisco Nexus 5500 Platform switches and the Cisco Nexus 5000 Platform switches.

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Conventions

This document uses the following conventions for notes, cautions, and safety warnings.

Notes and Cautions contain important information that you should be aware of.

Note Means *reader take note*. Notes contain helpful suggestions or references to material that are not covered in the publication.

Caution Means *reader be careful*. You are capable of doing something that might result in equipment damage or loss of data.

Safety warnings appear throughout this publication in procedures that, if performed incorrectly, can cause physical injuries. A warning symbol precedes each warning statement.

Warning **IMPORTANT SAFETY INSTRUCTIONS**

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device. Statement 1071

SAVE THESE INSTRUCTIONS

Waarschuwing **BELANGRIJKE VEILIGHEIDSINSTRUCTIES**

Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van de standaard praktijken om ongelukken te voorkomen. Gebruik het nummer van de verklaring onderaan de waarschuwing als u een vertaling van de waarschuwing die bij het apparaat wordt geleverd, wilt raadplegen.

BEWAAR DEZE INSTRUCTIES

Varoitus **TÄRKEITÄ TURVALLISUUSOHJEITA**

Tämä varoitusmerkki merkitsee vaaraa. Tilanne voi aiheuttaa ruumiillisia vammoja. Ennen kuin käsittelet laitteistoa, huomioi sähköpiirien käsittelemiseen liittyvät riskit ja tutustu onnettomuuksien yleisiin ehkäisytapoihin. Turvallisuusvaroitusten käännökset löytyvät laitteen mukana toimitettujen käännettyjen turvallisuusvaroitusten joukosta varoitusten lopussa näkyvien lausuntonumeroiden avulla.

SÄILYTÄ NÄMÄ OHJEET

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Attention **IMPORTANTES INFORMATIONS DE SÉCURITÉ**

Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant entraîner des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers liés aux circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions des avertissements figurant dans les consignes de sécurité traduites qui accompagnent cet appareil, référez-vous au numéro de l'instruction situé à la fin de chaque avertissement.

CONSERVEZ CES INFORMATIONS

Warnung **WICHTIGE SICHERHEITSHINWEISE**

Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu Verletzungen führen kann. Machen Sie sich vor der Arbeit mit Geräten mit den Gefahren elektrischer Schaltungen und den üblichen Verfahren zur Vorbeugung vor Unfällen vertraut. Suchen Sie mit der am Ende jeder Warnung angegebenen Anweisungsnummer nach der jeweiligen Übersetzung in den übersetzten Sicherheitshinweisen, die zusammen mit diesem Gerät ausgeliefert wurden.

BEWAHREN SIE DIESE HINWEISE GUT AUF.

Avvertenza **IMPORTANTI ISTRUZIONI SULLA SICUREZZA**

Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di intervenire su qualsiasi apparecchiatura, occorre essere al corrente dei pericoli relativi ai circuiti elettrici e conoscere le procedure standard per la prevenzione di incidenti. Utilizzare il numero di istruzione presente alla fine di ciascuna avvertenza per individuare le traduzioni delle avvertenze riportate in questo documento.

CONSERVARE QUESTE ISTRUZIONI

Advarsel **VIKTIGE SIKKERHETSINSTRUKSJONER**

Dette advarselssymbolet betyr fare. Du er i en situasjon som kan føre til skade på person. Før du begynner å arbeide med noe av utstyret, må du være oppmerksom på farene forbundet med elektriske kretser, og kjenne til standardprosedyrer for å forhindre ulykker. Bruk nummeret i slutten av hver advarsel for å finne oversettelsen i de oversatte sikkerhetsadvarslene som fulgte med denne enheten.

TA VARE PÅ DISSE INSTRUKSJONENE

Aviso **INSTRUÇÕES IMPORTANTES DE SEGURANÇA**

Este símbolo de aviso significa perigo. Você está em uma situação que poderá ser causadora de lesões corporais. Antes de iniciar a utilização de qualquer equipamento, tenha conhecimento dos perigos envolvidos no manuseio de circuitos elétricos e familiarize-se com as práticas habituais de prevenção de acidentes. Utilize o número da instrução fornecido ao final de cada aviso para localizar sua tradução nos avisos de segurança traduzidos que acompanham este dispositivo.

GUARDE ESTAS INSTRUÇÕES

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¡Advertencia! **INSTRUCCIONES IMPORTANTES DE SEGURIDAD**

Este símbolo de aviso indica peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considere los riesgos de la corriente eléctrica y familiarícese con los procedimientos estándar de prevención de accidentes. Al final de cada advertencia encontrará el número que le ayudará a encontrar el texto traducido en el apartado de traducciones que acompaña a este dispositivo.

GUARDE ESTAS INSTRUCCIONES

Varning! **VIKTIGA SÄKERHETSANVISNINGAR**

Denna varningssignal signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanliga förfaranden för att förebygga olyckor. Använd det nummer som finns i slutet av varje varning för att hitta dess översättning i de översatta säkerhetsvarningar som medföljer denna anordning.

SPARA DESSA ANVISNINGAR

Figyelem **FONTOS BIZTONSÁGI ELOÍRÁSOK**

Ez a figyelmezeto jel veszélyre utal. Sérülésveszélyt rejto helyzetben van. Mielott bármely berendezésen munkát végezte, legyen figyelemmel az elektromos áramkörök okozta kockázatokra, és ismerkedjen meg a szokásos balesetvédelmi eljárásokkal. A kiadványban szereplo figyelmeztetések fordítása a készülékhez mellékelt biztonsági figyelmeztetések között található; a fordítás az egyes figyelmeztetések végén látható szám alapján keresheto meg.

ORIZZE MEG EZEKET AZ UTASÍTÁSOKAT!

Предупреждение **ВАЖНЫЕ ИНСТРУКЦИИ ПО СОБЛЮДЕНИЮ ТЕХНИКИ БЕЗОПАСНОСТИ**

Этот символ предупреждения обозначает опасность. То есть имеет место ситуация, в которой следует опасаться телесных повреждений. Перед эксплуатацией оборудования выясните, каким опасностям может подвергаться пользователь при использовании электрических цепей, и ознакомьтесь с правилами техники безопасности для предотвращения возможных несчастных случаев. Воспользуйтесь номером заявления, приведенным в конце каждого предупреждения, чтобы найти его переведенный вариант в переводе предупреждений по безопасности, прилагаемом к данному устройству.

СОХРАНИТЕ ЭТИ ИНСТРУКЦИИ

警告 重要的安全性说明

此警告符号代表危险。您正处于可能受到严重伤害的工作环境中。在您使用设备开始工作之前，必须充分意识到触电的危险，并熟练掌握防止事故发生的标准工作程序。请根据每项警告结尾提供的声明号码来找到此设备的安全性警告说明的翻译文本。

请保存这些安全性说明

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警告　安全上の重要な注意事項

「危険」の意味です。人身事故を予防するための注意事項が記述されています。装置の取り扱い作業を行うときは、電気回路の危険性に注意し、一般的な事故防止策に留意してください。警告の各国語版は、各注意事項の番号を基に、装置に付属の「Translated Safety Warnings」を参照してください。

これらの注意事項を保管しておいてください。

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Aviso　**INSTRUÇÕES IMPORTANTES DE SEGURANÇA**

Este símbolo de aviso significa perigo. Você se encontra em uma situação em que há risco de lesões corporais. Antes de trabalhar com qualquer equipamento, esteja ciente dos riscos que envolvem os circuitos elétricos e familiarize-se com as práticas padrão de prevenção de acidentes. Use o número da declaração fornecido ao final de cada aviso para localizar sua tradução nos avisos de segurança traduzidos que acompanham o dispositivo.

GUARDE ESTAS INSTRUÇÕES

Advarsel　**VIGTIGE SIKKERHEDSANVISNINGER**

Dette advarselssymbol betyder fare. Du befinder dig i en situation med risiko for legemesbeskadigelse. Før du begynder arbejde på udstyr, skal du være opmærksom på de involverede risici, der er ved elektriske kredsløb, og du skal sætte dig ind i standardprocedurer til undgåelse af ulykker. Brug erklæringsnummeret efter hver advarsel for at finde oversættelsen i de oversatte advarsler, der fulgte med denne enhed.

GEM DISSE ANVISNINGER

تحذير　**إرشادات الأمان الهامة**

يوضح رمز التحذير هذا وجود خطر. وهذا يعني أنك متواجد في مكان قد ينتج عنه التعرض لإصابات. قبل بدء العمل، احذر مخاطر التعرض للصدمات الكهربائية وكن على علم بالإجراءات القياسية للحيلولة دون وقوع أي حوادث. استخدم رقم البيان الموجود في أخر كل تحذير لتحديد مكان ترجمته داخل تحذيرات الأمان المترجمة التي تأتي مع الجهاز.

قم بحفظ هذه الإرشادات

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Upozorenje

VAŽNE SIGURNOSNE NAPOMENE

Ovaj simbol upozorenja predstavlja opasnost. Nalazite se u situaciji koja može prouzročiti tjelesne ozljede. Prije rada s bilo kojim uređajem, morate razumjeti opasnosti vezane uz električne sklopove, te biti upoznati sa standardnim načinima izbjegavanja nesreća. U prevedenim sigurnosnim upozorenjima, priloženima uz uređaj, možete prema broju koji se nalazi uz pojedino upozorenje pronaći i njegov prijevod.

SAČUVAJTE OVE UPUTE

Upozornění

DŮLEŽITÉ BEZPEČNOSTNÍ POKYNY

Tento upozorňující symbol označuje nebezpečí. Jste v situaci, která by mohla způsobit nebezpečí úrazu. Před prací na jakémkoliv vybavení si uvědomte nebezpečí související s elektrickými obvody a seznamte se se standardními opatřeními pro předcházení úrazům. Podle čísla na konci každého upozornění vyhledejte jeho překlad v přeložených bezpečnostních upozorněních, která jsou přiložena k zařízení.

USCHOVEJTE TYTO POKYNY

Προειδοποίηση

ΣΗΜΑΝΤΙΚΕΣ ΟΔΗΓΙΕΣ ΑΣΦΑΛΕΙΑΣ

Αυτό το προειδοποιητικό σύμβολο σημαίνει κίνδυνο. Βρίσκεστε σε κατάσταση που μπορεί να προκαλέσει τραυματισμό. Πριν εργαστείτε σε οποιοδήποτε εξοπλισμό, να έχετε υπόψη σας τους κινδύνους που σχετίζονται με τα ηλεκτρικά κυκλώματα και να έχετε εξοικειωθεί με τις συνήθεις πρακτικές για την αποφυγή ατυχημάτων. Χρησιμοποιήστε τον αριθμό δήλωσης που παρέχεται στο τέλος κάθε προειδοποίησης, για να εντοπίσετε τη μετάφρασή της στις μεταφρασμένες προειδοποιήσεις ασφαλείας που συνοδεύουν τη συσκευή.

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אזהרה

הוראות בטיחות חשובות

סימן אזהרה זה מסמל סכנה. אתה נמצא במצב העלול לגרום לפציעה. לפני שתעבוד עם ציוד כלשהו, עליך להיות מודע לסכנות הכרוכות במעגלים חשמליים ולהכיר את הנהלים המקובלים למניעת תאונות. השתמש במספר ההוראה המסופק בסופה של כל אזהרה כד לאתר את התרגום באזהרות הבטיחות המתורגמות שמצורפות להתקן.

שמור הוראות אלה

ВАЖНИ БЕЗБЕДНОСНИ НАПАТСТВИЈА

Симболот за предупредување значи опасност. Се наоѓате во ситуација што може да предизвика телесни повреди. Пред да работите со опремата, бидете свесни за ризикот што постои кај електричните кола и треба да ги познавате стандардните постапки за спречување на несреќни случаи. Искористете го бројот на изјавата што се наоѓа на крајот на секое предупредување за да го најдете неговиот период во преведените безбедносни предупредувања што се испорачани со уредот.

ЧУВАЈТЕ ГИ ОВИЕ НАПАТСТВИЈА

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WAŻNE INSTRUKCJE DOTYCZĄCE BEZPIECZEŃSTWA

Ten symbol ostrzeżenia oznacza niebezpieczeństwo. Zachodzi sytuacja, która może powodować obrażenia ciała. Przed przystąpieniem do prac przy urządzeniach należy zapoznać się z zagrożeniami związanymi z układami elektrycznymi oraz ze standardowymi środkami zapobiegania wypadkom. Na końcu każdego ostrzeżenia podano numer, na podstawie którego można odszukać tłumaczenie tego ostrzeżenia w dołączonym do urządzenia dokumencie z tłumaczeniami ostrzeżeń.

NINIEJSZE INSTRUKCJE NALEŻY ZACHOWAĆ

Upozornenie

DÔLEŽITÉ BEZPEČNOSTNÉ POKYNY

Tento varovný symbol označuje nebezpečenstvo. Nachádzate sa v situácii s nebezpečenstvom úrazu. Pred prácou na akomkoľvek vybavení si uvedomte nebezpečenstvo súvisiace s elektrickými obvodmi a oboznámte sa so štandardnými opatreniami na predchádzanie úrazom. Podľa čísla na konci každého upozornenia vyhľadajte jeho preklad v preložených bezpečnostných upozorneniach, ktoré sú priložené k zariadeniu.

USCHOVAJTE SI TENTO NÁVOD

Opozorilo

POMEMBNI VARNOSTNI NAPOTKI

Ta opozorilni simbol pomeni nevarnost. Nahajate se v situaciji, kjer lahko pride do telesnih poškodb. Preden pričnete z delom na napravi, se morate zavedati nevarnosti udara električnega toka, ter tudi poznati preventivne ukrepe za preprečevanje takšnih nevarnosti. Uporabite obrazložitveno številko na koncu posameznega opozorila, da najdete opis nevarnosti v priloženem varnostnem priročniku.

SHRANITE TE NAPOTKE!

警告

重要安全性指示
此警告符號代表危險，表示可能造成人身傷害。使用任何設備前，請留心電路相關危險，並熟悉避免意外的標準作法。您可以使用每項警告後的聲明編號，查詢本裝置隨附之安全性警告譯文中的翻譯。
請妥善保留此指示

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Related Documentation

Documentation for Cisco MDS 9200 Series Switches and Cisco Nexus 2000 Series Fabric Extenders is available at the following URL:

http://www.cisco.com/en/US/products/ps9670/tsd_products_support_series_home.html

The following are related Cisco MDS 9200 Series and Cisco Nexus 2000 Series Fabric Extender documents:

Release Notes

Cisco Nexus 5000 Series and Cisco Nexus 2000 Series Release Notes

Cisco Nexus 5000 Series Switch Release Notes

Configuration Guides

Cisco Nexus 5000 Series Configuration Limits for Cisco NX-OS Release 5.0(2)N1(1)

Cisco Nexus 5000 Series Configuration Limits for Cisco NX-OS Release 4.2(1)N1(1) and Release 4.2(1)N2(1)

Cisco Nexus 5000 Series NX-OS Fibre Channel over Ethernet Configuration Guide

Cisco Nexus 5000 Series NX-OS Layer 2 Switching Configuration Guide

Cisco Nexus 5000 Series NX-OS Multicast Routing Configuration Guide

Cisco Nexus 5000 Series NX-OS Quality of Service Configuration Guide

Cisco Nexus 5000 Series NX-OS SAN Switching Configuration Guide

Cisco Nexus 5000 Series NX-OS Security Configuration Guide

Cisco Nexus 5000 Series NX-OS System Management Configuration Guide

Cisco Nexus 5000 Series NX-OS Unicast Routing Configuration Guide

Cisco Nexus 5000 Series Switch NX-OS Software Configuration Guide

Cisco Nexus 5000 Series Fabric Manager Configuration Guide, Release 3.4(1a)

Cisco Nexus 7000 Series NX-OS Fundamentals Configuration Guide, Release 4.2

Cisco Nexus 2000 Series Fabric Extender Software Configuration Guide

Maintain and Operate Guides

Cisco Nexus 5000 Series NX-OS Operations Guide

Installation and Upgrade Guides

Cisco Nexus 5000 Series and Cisco Nexus 5500 Platform Hardware Installation Guide

Cisco Nexus 2000 Series Hardware Installation Guide

Cisco Nexus 5000 Series NX-OS Software Upgrade and Downgrade Guide, Release 4.2(1)N1(1)

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Regulatory Compliance and Safety Information for the Cisco Nexus 5000 Series Switches and Cisco Nexus 2000 Series Fabric Extenders

Licensing Guide

Cisco NX-OS Licensing Guide

Command References

Cisco Nexus 5000 Series Command Reference

Technical References

Cisco Nexus 5000 Series and Cisco Nexus 2000 Series Fabric Extender MIBs Reference

Error and System Messages

Cisco NX-OS System Messages Reference

Troubleshooting Guide

Cisco Nexus 5000 Troubleshooting Guide

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

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CHAPTER 1

Overview

This chapter provides an overview of the Cisco Nexus 5000 Series switches, which include the Cisco Nexus 5000 Platform switches and the Cisco Nexus 5500 Platform switches. The overview of each of these switches includes information on the expansion modules, power supplies, and fan modules that you can include with them.

This chapter includes the following sections:

- Cisco Nexus 5500 Platform Switches, page 1-1
- Cisco Nexus 5000 Platform Switches, page 1-29

Cisco Nexus 5500 Platform Switches

The Cisco Nexus 5500 Platform supports the following application scenarios, many of which require the installation of other products:

- As an access-layer switch, it can be used purely as a 1- and 10-Gigabit Ethernet switch, consolidating 10 Gigabit Ethernet connections into a smaller number of server connections trunked to the aggregation layer.
- As a smaller-scale aggregation switch, it can be used as a Layer 3 1- and 10-Gigabit Ethernet switch, consolidating multiple 1- and 10-Gigabit Ethernet connections from a data center access layer.
- In conjunction with the Cisco Nexus 2248T GE Ethernet Fabric Extender, the Cisco Nexus 5500 Platform can be a high-density 1-Gigabit Ethernet switching system, consolidating more than 900 Gigabit Ethernet connections within a single management plane.
- In conjunction with the Cisco Nexus 2232T 10GE Fabric Extender, it can be a high-density switching system, consolidating more than 600 10-Gigabit Ethernet connections within a single management plane.
- In conjunction with the Cisco Nexus 2224TM 10GE Fabric Extender, it can be a high-density switching system, consolidating more than 600 10-Gigabit Ethernet connections within a single management plane
- As a rack-level I/O consolidation platform, the switch carries Ethernet traffic from servers to the aggregation layer and carries FC traffic to existing Fibre Channel SANs.
- As a crucial element in data center I/O consolidation, the switch enables I/O consolidation at the access layer and provides interoperability with the Cisco Nexus 5500 Platform and other standards-based products.

This section describes the Cisco Nexus 5500 Platform switches and contains these sections:

- Cisco Nexus 5596UP Switch, page 1-2

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- Cisco Nexus 5596T Switch, page 1-12
- Cisco Nexus 5548UP and 5548P Switches, page 1-17

Cisco Nexus 5596UP Switch

This section describes the Cisco Nexus 5596UP switch and its components. This section includes the following topics:

- Features, page 1-2
- Chassis, page 1-2
- Expansion Modules, page 1-4
- Ports, page 1-7
- Power Supply, page 1-8
- Fan Module, page 1-10
- Transceivers, page 1-11

Features

The Cisco Nexus 5596UP switch is a top-of-rack, 10-Gigabit Ethernet and Fibre channel over Ethernet (FCoE) switch offering up to 1920 Gigabit throughput and up to 96 ports. The switch has 48 1- and 10-Gigabit Ethernet and FCoE ports and three expansion slots. As a top-of-rack switch, all the servers in the rack connect to the Cisco Nexus 5596UP switch, and it connects to the LAN or SAN.

The Cisco Nexus 5596UP switch has the following features:

- 48 fixed 1- and 10-Gigabit Ethernet server connection ports on the back of the switch
- Three slots on the back of the switch for optional expansion modules, which can be either a 16-port 10-Gigabit generic expansion module 2 (GEM2) or a layer 3 GEM2
- Two slots on the front of the switch for hot swap-capable power supplies, which provide front-to-back airflow for cooling
- Four slots on the front of the switch for hot swap-capable fan modules.
- Layer 2 or Layer 3 I/O modules
- One USB port on the front of the switch

Chassis

The Cisco Nexus 5596UP chassis is 2 RU or 3.47 inches (8.8 cm) tall, 17.3 inches (43.9 cm) wide, and 29.5 inches (74.9 cm) deep. It is designed to be mounted in a standard 19-inch wide rack. The front of the switch, shown in Figure 1-1, has a USB port, four Ethernet and ports (two cross-connect ports, one management port, and one console port), two power supplies, and four fan modules.

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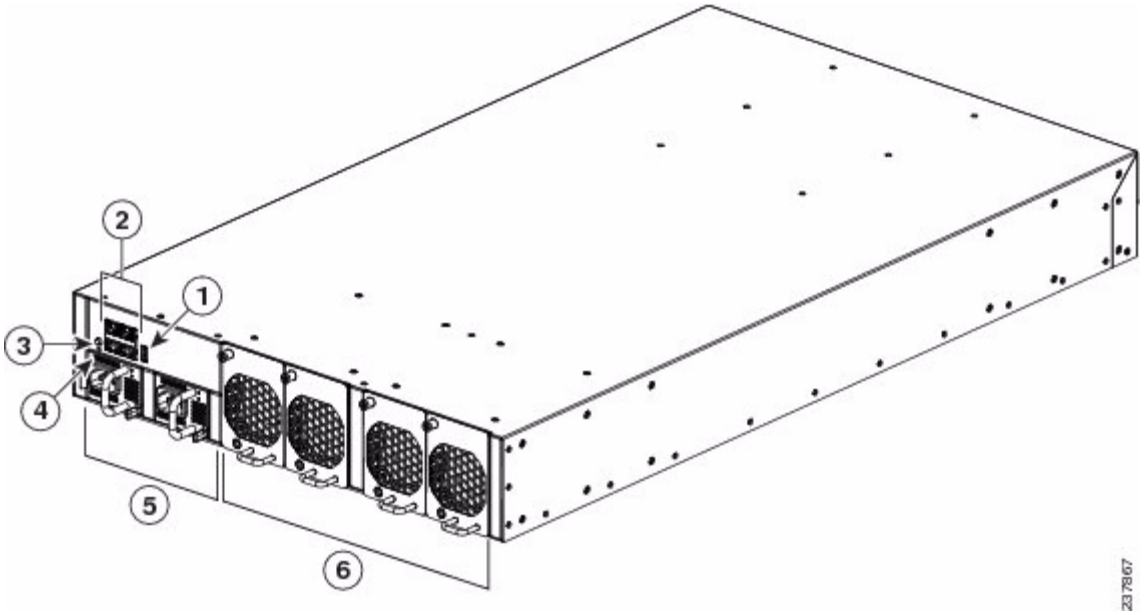
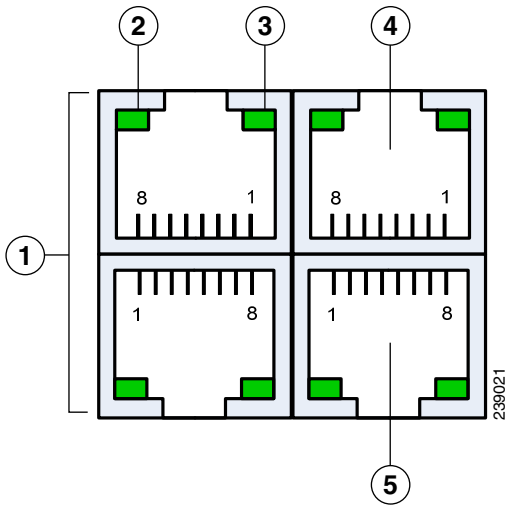
Figure 1-1 Front View of the Cisco Nexus 5596UP Switch



1	USB port	**4**	System status LED
2	Management and console ports (two RJ-45 Ethernet connector ports on the left, a RJ-45 network management connector on the upper right, and a console connector on the lower right)	**5**	Two power supplies
3	Identifier LED	**6**	Four fan modules

The management and console ports are in a 2 x 2 stacked RJ-45 jack. Figure 1-2 shows a close-up view of these ports. For information about the connector port LEDs, see Table D-1 on page D-2.

Figure 1-2 Management and Console Ports



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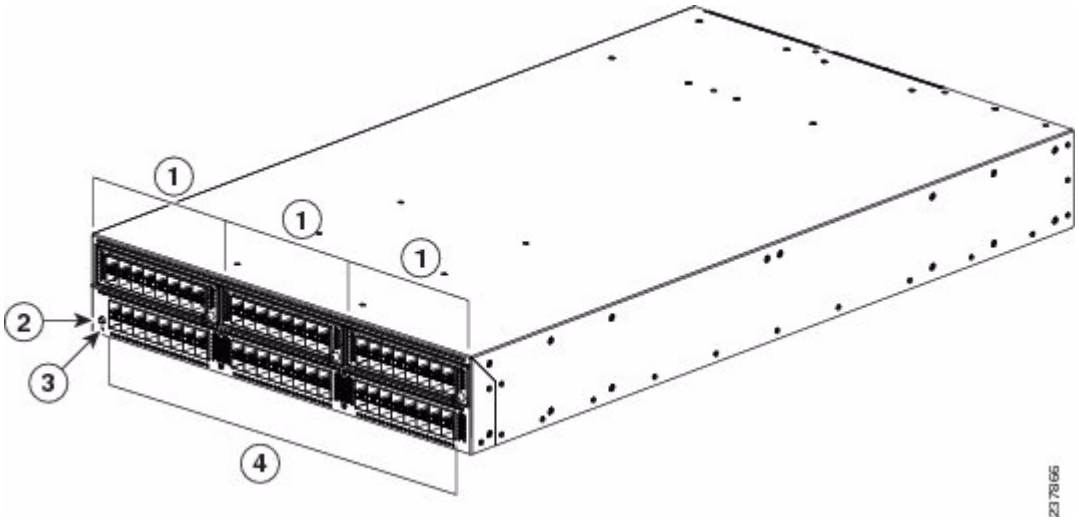
1	Internal cross-connect ports	4	Network management port
2	Link LED (left LED)	5	Console port
3	Activity LED (right LED)		

The rear of the Cisco Nexus 5596UP chassis, shown in Figure 1-3, has 48 fixed 10-Gigabit Ethernet data ports on the bottom and three slots for optional expansion modules on top.

Figure 1-3 Rear View of the Cisco Nexus 5596UP Switch



1	Expansion modules, shown here with three 16-port Universal GEM2 modules (can also have Layer 3 GEM2 modules)	3	System status LED
2	Identifier LED	4	48 fixed 1- and 10-Gigabit Ethernet ports

Note The L1/L2/Mgmt1 ports are not usable. They are disabled at this time.

Expansion Modules

Expansion modules allow the Cisco Nexus 5596UP switch to be configured as cost-effective 10-Gigabit Ethernet switches and as I/O consolidation platforms with native Fibre Channel connectivity.

The Cisco Nexus 5596UP switch has three slots that can be used for the following optional expansion modules:

- 4-port QSFP expansion module
- 16-port Universal (Fibre Channel and Ethernet) GEM (N55-M16UP) that provides 8-, 4-, 2-, or 1-Gbps Fibre Channel and 1- or 10-Gigabit Ethernet ports

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- Layer 3 GEMs (N55-M160L3 and N55-M160L3-V2) provide 160 Gbps of Layer 3 services. The N55-M160L3-V2 uses a newer version of the Layer 3 ASIC that enables higher table sizes in a future software release from 8K host entries to 16K host entries or from 4K multicast routes to 8K multicast routes (IPv4).

You can hot swap the expansion modules during operations.

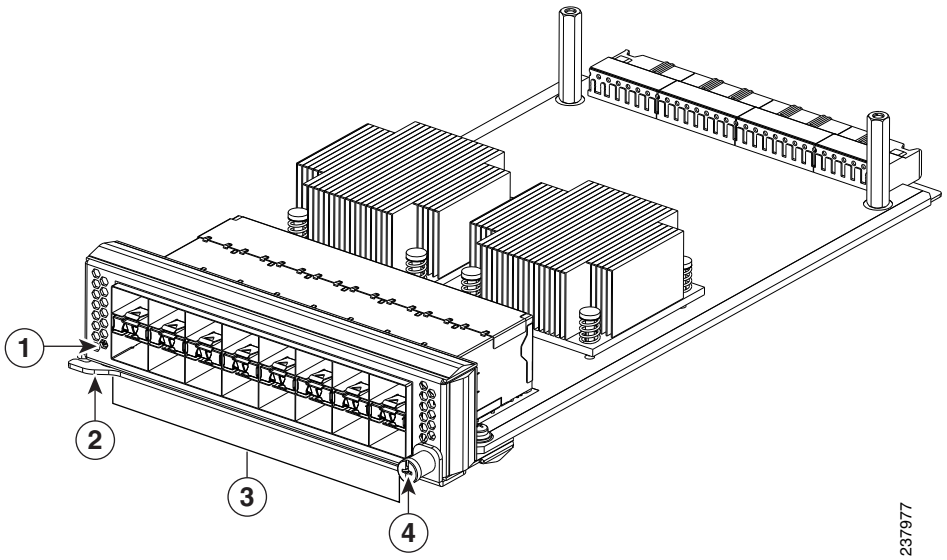
This section includes the following topics:

- 4-port QSFP GEM, page 1-5
- 16-port Universal GEM2, page 1-5
- Layer 3 GEM, page 1-6

4-port QSFP GEM

he 16-port Universal GEM2, shown in Figure 1-5, has 16 8-, 4-, 2-, or 1-Gbps Fibre Channel or 1- and 10-Gigabit Ethernet ports. This module is a field-replaceable unit (FRU) that you can hot swap during operations.

Figure 1-4 16-Port Universal GEM2



16-port Universal GEM2

The 16-port Universal GEM2, shown in Figure 1-5, has 16 8-, 4-, 2-, or 1-Gbps Fibre Channel or 1- and 10-Gigabit Ethernet ports. This module is a field-replaceable unit (FRU) that you can hot swap during operations.

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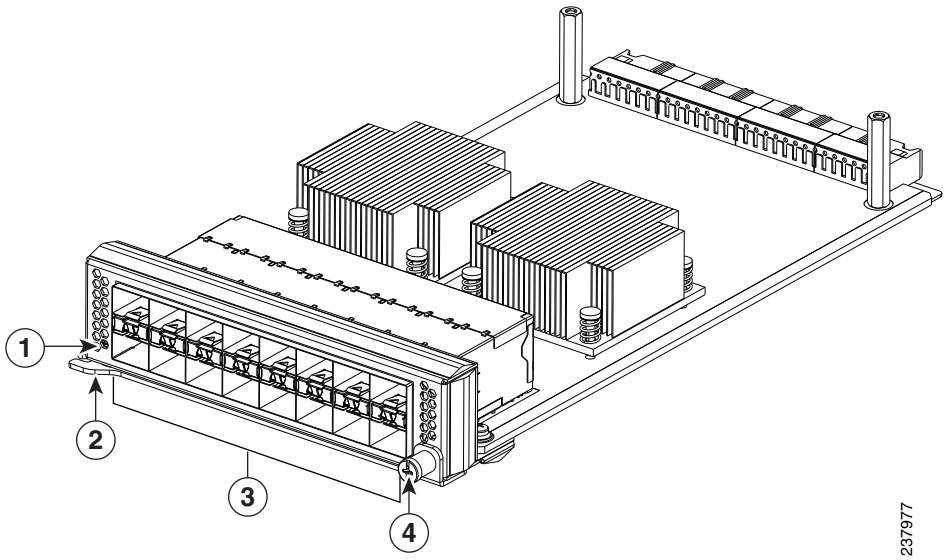
Figure 1-5 16-Port Universal GEM2



1	Status LED	**3**	16 ports supporting 8-, 4-, 2-, or 1-Gbps transceivers or 1- and 10-Gigabit transceivers
2	Eject lever	**4**	Captive screw that locks the eject lever in a closed position

See Figure 1-7 on page 1-7 to see how ports are grouped and numbered on the Fibre Channel plus Ethernet expansion module.

Layer 3 GEM

The Layer 3 GEMs (N55-M160L3 and N55-M160L3-V2), shown in Figure 1-6, provide 160 Gbps of Layer 3 services. The expansion modules are field-replaceable units (FRU's). The N55-M160L3-V2 uses a newer version of the Layer 3 ASIC that enables higher table sizes in a future software release from 8K host entries to 16K host entries or from 4K multicast routes to 8K multicast routes (IPv4).

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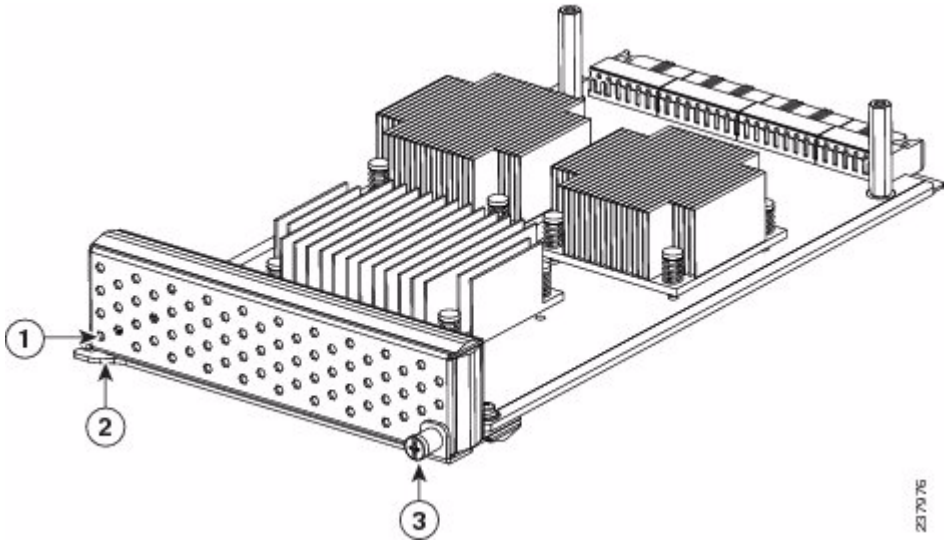
Figure 1-6 Layer 3 GEM2



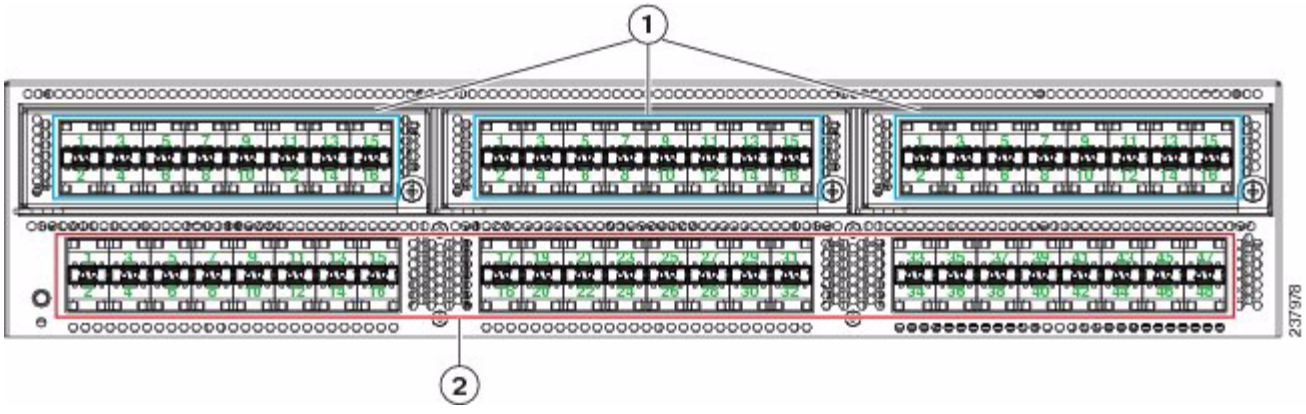
1	Status LED	3	Captive screw that locks the eject lever in a closed position
2	Ejector lever		

Ports

Each port on the Cisco Nexus 5596UP switch is numbered, and groups of ports are numbered based on their function. The ports are numbered top to bottom and left to right. The 48 fixed ports support 8-, 4-, 2-, or 1-Gbps Fibre Channel transceivers and 1- or 10-Gigabit Ethernet transceivers.

Figure 1-7 shows how ports are numbered and grouped by function for both the fixed ports and the Fibre Channel plus Ethernet expansion module ports.

Figure 1-7 Port Numbering of Fixed Ports and Fibre Channel Plus Ethernet Expansion Module Ports



1	Port numbering for the 16-port GEM	2	Port numbering for the 48 fixed ports

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Power Supply

The Cisco Nexus 5596UP uses a front-end power supply. The chassis has slots for two power supplies. The Cisco Nexus 5596UP switch is fully functional with one power supply, but you can include a second power supply for power redundancy.

Table 1-1 lists the power supplies that you can order with the Cisco Nexus 5500 Platform switches.

Table 1-1 Power Supplies for the Cisco Nexus 5500 Platform switches

Part Number	Power Supply
N55-PAC-750W	Cisco Nexus 5548P/5548UP PSU Front-to-Back Airflow module, A/C, 100-240V, 750W
N55-PAC-750W(=)	Cisco Nexus 5548P/5548UP PSU Front-to-Back Airflow module spare, A/C, 100-240V, 750W
N55-PAC-750W-B	Cisco Nexus 5548UP PSU Back-to-Front Airflow module, A/C, 100-240V, 750W
N55-PAC-750W-B(=)	Cisco Nexus 5548UP PSU Back-to-Front Airflow module spare, A/C, 100-240V, 750W
N55-PDC-750W	Cisco Nexus 5548P/5548UP PSU Front-to-Back Airflow module, D/C, -40 to -72VDC, 750W
N55-PDC-750W(=)	Cisco Nexus 5548P/5548UP PSU Front-to-Back Airflow module spare, D/C, -40 to -72VDC, 750W
N55-PAC-1100W	Cisco Nexus 5596UP PSU Front-to-Back Airflow module, A/C, 100-240V, 1100W
N55-PAC-1100W(=)	Cisco Nexus 5596UP PSU Front-to-Back Airflow module spare, A/C, 100-240V, 1100W
N55-PAC-1100W-B	Cisco Nexus 5596UP/5596T PSU Back-to-Front Airflow module, A/C, 100-240V, 1100W
N55-PAC-1100W-B(=)	Cisco Nexus 5596UP/5596T PSU Back-to-Front Airflow module spare, A/C, 100-240V, 1100W
N55-PDC-1100W	Cisco Nexus 5596UP/5596T PSU , DC Front-to-Back, 1100 W

Note Front to Back (FAF) Airflow and DC Power Supply is now supported for the Cisco Nexus 5596T. For details see the *Cisco Nexus 5500 Datasheet.*

Figure 1-8 shows an AC power supply. For more information on the LEDs, see Table D-1 on page D-2.

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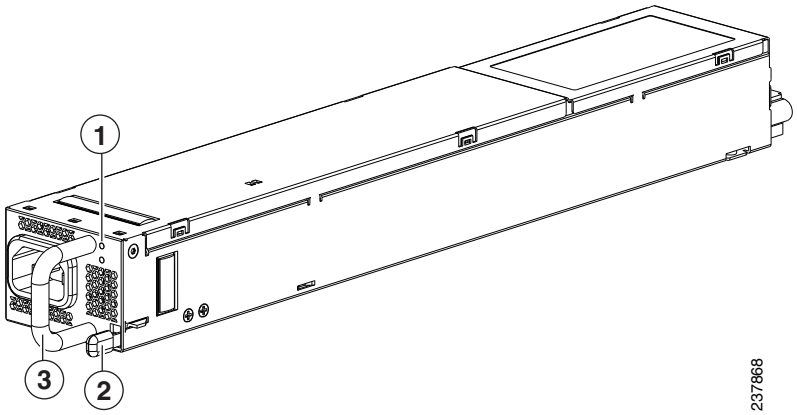
Figure 1-8 AC Power Supply for the Cisco Nexus 5596UP Switch



1	Failure (top) and Power (bottom) LEDs	**3**	Release lever
2	Handle		

Figure 1-9 shows the NXA-PAC-1100W .

Figure 1-9 NXA-PAC-1100W

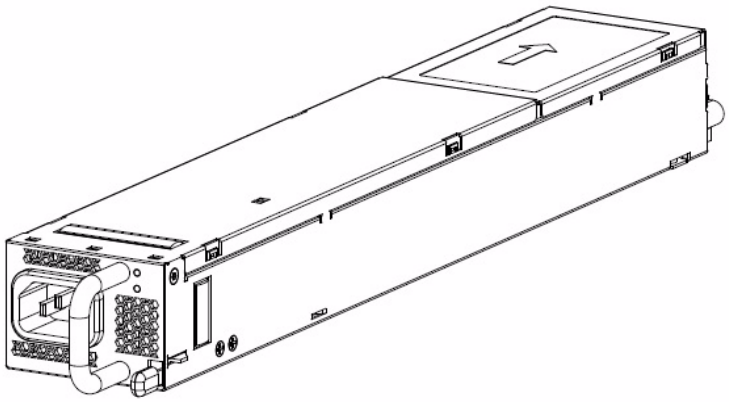


Figure 1-10 shows the NXA-PAC-1100W-B

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Figure 1-10 NXA-PAC-1100W-B

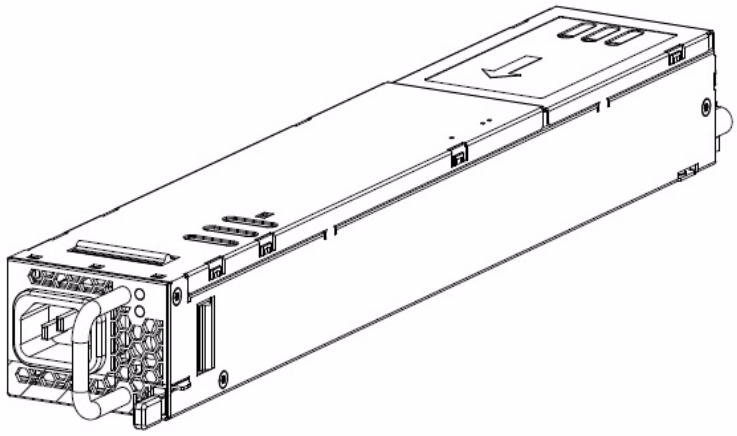
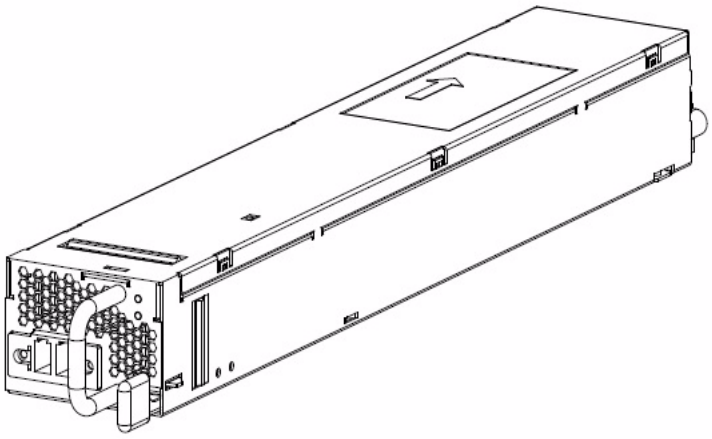


Figure 1-11 shows NXA-PDC-1100W

Figure 1-11 *NXA-PDC-1100W*



Note Never leave a power supply slot empty. If you remove a power supply, replace it with another one. If you do not have a replacement power supply, leave the non functioning one in place until you can replace it.

Fan Module

The Cisco Nexus 5596UP switch has four fan modules. Although the switch can function when a fan stops functioning within a fan module, if a whole fan module stops functioning, you must replace the fan module. The Cisco Nexus 5596UP supports the reverse air flow fan tray (N5596UP-FAN-B).

Figure 1-12 shows a fan module.

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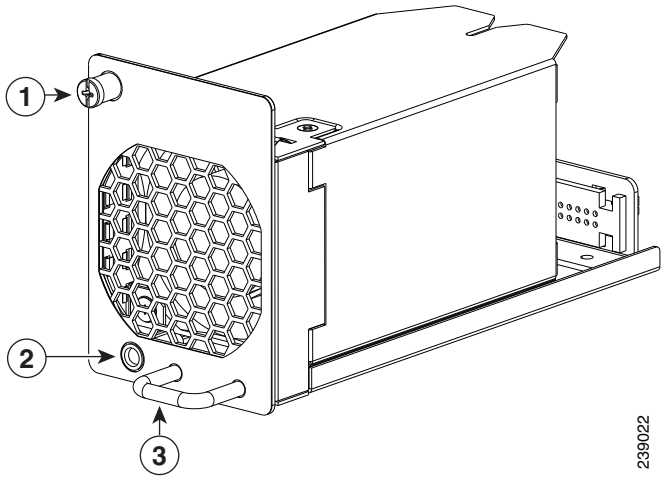
Caution You must order all fan modules and power supplies in the same chassis so that they have the same direction of airflow with coolant air entering the chassis from the cold aisle and exhausting to the hot aisle.

Figure 1-12 Cisco Nexus 5596 Fan Module



1	Captive screw	**3**	Handle
2	Status LED		

The bicolor status LED indicates fan tray health. Green indicates normal operation, while amber indicates a fan failure. For more information about LEDs, see Table D-1 on page D-2.

Transceivers

The Cisco Nexus 5596 switch supports both SFP and SFP+ Ethernet transceivers and SFP Fibre Channel transceivers.

This section includes the following topics:

- SFP+ Transceivers, page 1-11
- SFP+ Copper Cables, page 1-12
- SFP Fibre Channel Transceivers, page 1-12
- CWDM Optics, page 1-12

SFP+ Transceivers

The enhanced SFP+ 10-Gigabit Ethernet transceiver module is a bidirectional device with a transmitter and receiver in the same physical package. It has a 20-pin connector on the electrical interface and duplex LC connector on the optical interface.The Cisco Nexus 5596 supports the SFP-10G-SR transceiver.

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Model	Description
SFP-10G-SR	10-Gigabit Ethernet—short range SFP+ module

SFP+ Copper Cables

Copper cables are available for use with the 10-Gigabit Ethernet SFP+ module. The cables come in the following lengths:

- 1 m, 30 AWG
- 3 m, 28–30 AWG
- 5 m, 26–28 AWG

Model	Description
SFP-H10GB-CU1M	10GBASE-CU SFP+ Cable (1 meter)
SFP-H10GB-CU3M	10GBASE-CU SFP+ Cable (3 meters)
SFP-H10GB-CU5M	10GBASE-CU SFP+ Cable (5 meters)

SFP Fibre Channel Transceivers

The Cisco Nexus 5596 switch also supports the following SFP Fibre Channel transceiver:

Model	Description
DS-SFP-FC4G-SW	4-, 2-, or 1-Gbps Fibre Channel—Short wavelength SFP module

CWDM Optics

The Cisco Nexus 5596 switch also supports the following CWDM optics:

Model	Description
DS-CWDM4G1470=	1470 nm CWDM 1/2/4-Gbps Fibre Channel SFP
DS-CWDM4G1610=	1610 nm CWDM 1/2/4-Gbps Fibre Channel SFP

Cisco Nexus 5596T Switch

The Nexus 5596T is based on the same ASIC and chassis as the 5596UP. The Nexus 5596T switch is a 2RU switch, with 32 fixed ports of 10G BaseT and 16 fixed 10G Unified ports, which support (Ethernet, FC, FCoE). All the existing GEMs supported on the Nexus 5500 switches will be supported on the Nexus 5596T. In addition, the Nexus 5596T will also support the new 12 port 10G BaseT expansion module. With this module,you can use the Nexus 5596T to deploy upto 68 ports of 10G BaseT in a 2RU

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form factor. The 10G BASE-T ports support FCoE up to 30m distance with Category 6a and Category 7 cable. This switch supports both Front-to-Back and Back-to-Front airflow. The 12 port 10G BaseT module will be supported on the Nexus 5596T chassis. The orderability information is as follows:

- N5K-C5596T-FA: Nexus 5596T 2RU, 2PS/4Fans, 32x10GT/16xSFP+ Fixed Ports
- N55-M12T: Nexus 5500 Module 12p 10GT

This section describes the Cisco Nexus 5596T switch and its components. This section includes the following topics:

- Features, page 1-13
- Chassis, page 1-13
- Ports, page 1-15
- Power Supply, page 1-16
- Fan Module, page 1-16
- Transceivers, page 1-16

Features

The Cisco Nexus 5596T switch is a 2RU switch, with 32 fixed ports of 10GBASE-T and 16 SFP+ fixed ports. The switch also supports up to three expansion slots. The switch supports 10 Gigabit Ethernet (fiber and copper), Fibre Channel, and FCoE, offering up to 1920 Gbps of throughput and up to 96 ports. The switch supports unified ports on all SFP+ ports. The hardware for the 10GBASE-T ports is capable of supporting FCoE. FCOE on 10GBaseT ports is supported only for lengths less than or equal to 30m.

The Cisco Nexus 5596T switch has the following features:

- 32 fixed ports of 10GBASE-T and 16 fixed ports of SFP+ on the back of the switch
- Three slots on the back of the switch for optional expansion modules
- Two slots on the front of the switch for hot swap-capable power supplies, which provide back-to-front airflow for cooling
- Four slots on the front of the switch for hot swap-capable fan modules, which provide back-to-front airflow for cooling.
- Layer 2 or Layer 3 I/O modules
- One USB port on the front of the switch

Chassis

The Cisco Nexus 5596T chassis is 2 RU or 3.47 inches (8.8 cm) tall, 17.3 inches (43.9 cm) wide, and 29.5 inches (74.9 cm) deep. It is designed to be mounted in a standard 19-inch wide rack. The front of the switch is shown in Figure 1-13.

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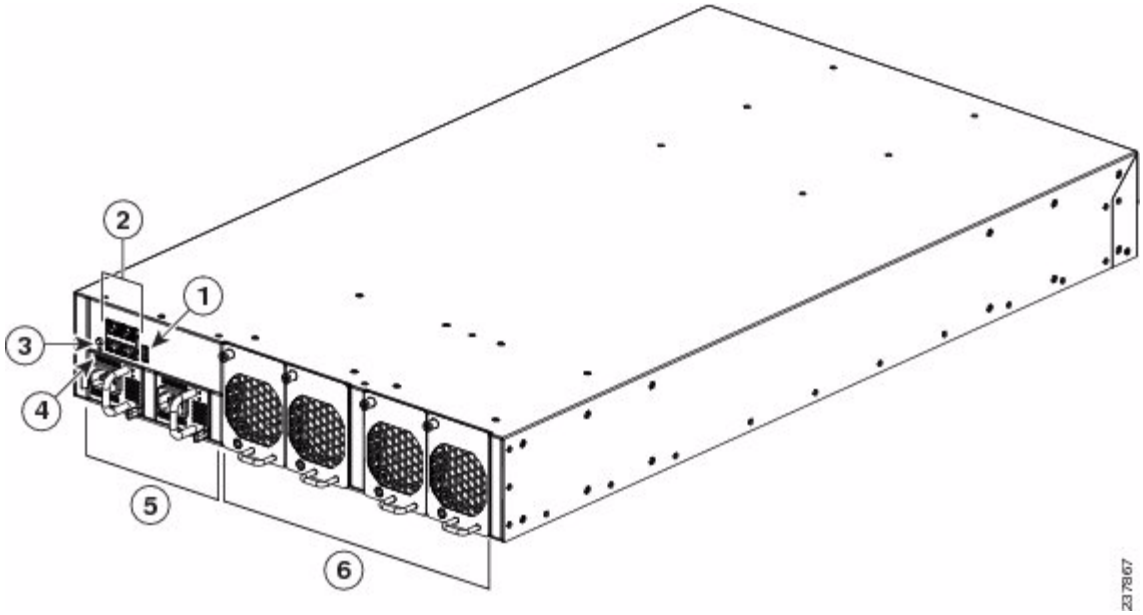
Figure 1-13 Front View of the Cisco Nexus 5596T Switch

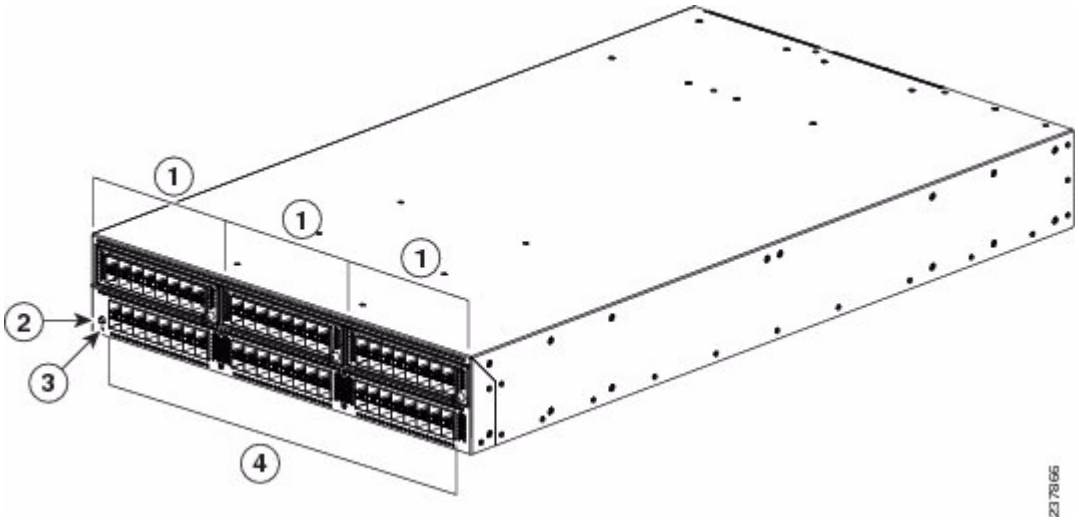


1	USB port	**4**	System status LED
2	Management and console ports (two RJ-45 Ethernet connector ports on the left, a RJ-45 network management connector on the upper right, and a console connector on the lower right)	**5**	Two power supplies
3	Identifier LED	**6**	Four fan modules

The management and console ports are in a 2 x 2 stacked RJ-45 jack. Figure 1-2 shows a close-up view of these ports. For information about the connector port LEDs, see Table D-1 on page D-2.

The rear of the Cisco Nexus 5596T chassis, shown in Figure 1-14, has 32 fixed ports of 10GBASE-T and 16 fixed ports of SFP+. It also has up to three expansion slots.

Figure 1-14 Rear View of the Cisco Nexus 5596T Switch



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1	Expansion modules	3	System status LED
2	Identifier LED	4	32 fixed ports of 10GBASE-T and 16 fixed ports of SFP+

Expansion Modules

Expansion modules allow the Cisco Nexus 5596T switch to be configured as cost-effective 10-Gigabit Ethernet switches and as I/O consolidation platforms with native Fibre Channel connectivity.

The Cisco Nexus 5596T switch has three slots that can be used for the following optional expansion modules:

- Ethernet module that provides sixteen 1- or 10-Gigabit Ethernet and FCoE ports using the SFP+ interface
- Fibre Channel plus Ethernet module that provides eight 1- or 10-Gigabit Ethernet and FCoE ports using the SFP+ interface, and eight ports of 8/4/2/1-Gbps native Fibre Channel connectivity using the SFP+/SFP interface
- Unified port module that provides up to sixteen 1- or 10-Gigabit Ethernet and FCoE ports using the SFP+ interface or up to sixteen ports of 8/4/2/1-Gbps native Fibre Channel connectivity using the SFP+ and SFP interfaces. The use of 1- or 10-Gigabit Ethernet or 8/4/2/1-Gbps Fibre Channel on a port is mutually exclusive but can be selected for any of the 16 physical ports per module
- Ethernet module that provides twelve 10GBASE-T ports (N55-M12T). The hardware is FCoE capable

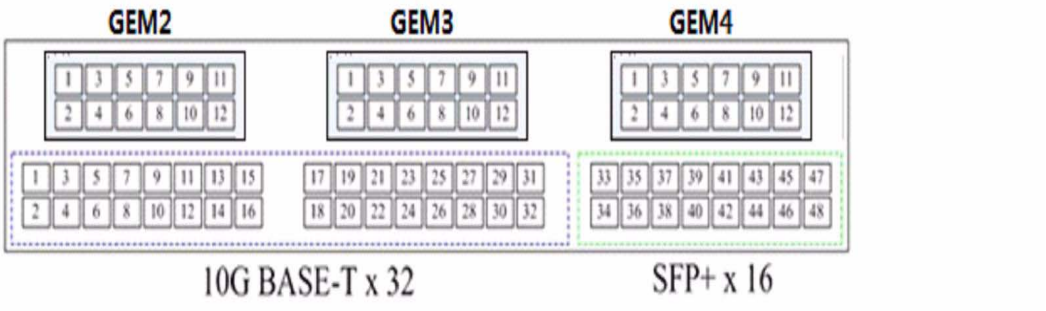
You can hot swap the expansion modules during operations.

Ports

Each port on the Cisco Nexus 5596T is numbered, and groups of ports are numbered based on their function. The ports are numbered top to bottom and left to right.

Figure 1-15 shows how ports are numbered and grouped by function.

Figure 1-15 Port Numbering



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Power Supply

The Cisco Nexus 5596T uses a front-end power supply. The chassis has slots for two power supplies. The Cisco Nexus 5596T switch is fully functional with one power supply, but you can include a second power supply for power redundancy.

Table 1-1 lists the power supplies that you can order with the Cisco Nexus 5500 Platform switches.

Note Front to Back (FAF) Airflow and DC Power Supply is now supported for the Cisco Nexus 5596T. For details see the *Cisco Nexus 5500 Datasheet.*

Figure 1-8 , Figure 1-9, Figure 1-10, Figure 1-11show the power supplies that can be ordered with the Cisco Nexus 5500 switches. For more information on the LEDs, see Table D-1 on page D-2.

Note Never leave a power supply slot empty. If you remove a power supply, replace it with another one. If you do not have a replacement power supply, leave the non functioning one in place until you can replace it.

Fan Module

The Cisco Nexus 5596T switch has four fan modules. Although the switch can function when a fan stops functioning within a fan module, if a whole fan module stops functioning, you must replace the fan module. The Cisco Nexus 5596T supports the reverse air flow fan tray (N5596UP-FAN-B).

Transceivers

The Cisco Nexus 5596T switch supports both SFP and SFP+ Ethernet transceivers and SFP Fibre Channel transceivers.

This section includes the following topics:

- SFP+ Transceivers, page 1-16
- SFP+ Copper Cables, page 1-17
- SFP Fibre Channel Transceivers, page 1-17
- CWDM Optics, page 1-12

SFP+ Transceivers

The enhanced SFP+ 10-Gigabit Ethernet transceiver module is a bidirectional device with a transmitter and receiver in the same physical package. It has a 20-pin connector on the electrical interface and duplex LC connector on the optical interface.

Model	Description
SFP-10G-SR	10-Gigabit Ethernet—short range SFP+ module
SFP-10G-LR(=)	10GBASE-LR SFP+ Module
SFP-10G-ER(=)	10GBASE-ER-SFP+ Module

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SFP+ Copper Cables

Copper cables are available for use with the 10-Gigabit Ethernet SFP+ module. The cables come in the following lengths:

- 1 m, 30 AWG
- 3 m, 28–30 AWG
- 5 m, 26–28 AWG

Model	Description
SFP-H10GB-CU1M	10GBASE-CU SFP+ Cable (1 meter)
SFP-H10GB-CU3M	10GBASE-CU SFP+ Cable (3 meters)
SFP-H10GB-CU5M	10GBASE-CU SFP+ Cable (5 meters)

SFP Fibre Channel Transceivers

The Cisco Nexus 5596T switch also supports the following SFP Fibre Channel transceiver:

Model	Description
DS-SFP-FC4G-SW	4-, 2-, or 1-Gbps Fibre Channel—Short wavelength SFP module

CWDM Optics

The Cisco Nexus 5596T switch also supports the following CWDM optics:

Model	Description
DS-CWDM4G1470=	1470 nm CWDM 1/2/4-Gbps Fibre Channel SFP
DS-CWDM4G1610=	1610 nm CWDM 1/2/4-Gbps Fibre Channel SFP

Cisco Nexus 5548UP and 5548P Switches

This section describes the Cisco Nexus 5548UP and 5548P switches and their components. The Cisco Nexus 5548UP switch provides universal ports that support Ethernet and fibre channel over Ethernet (FCoE) connections. The Cisco Nexus 5548P switch provides ports that support Ethernet connections. Collectively, these switches are referred to as Cisco Nexus 5548 switches.

This section includes the following topics:

- Features, page 1-18
- Chassis, page 1-18
- Expansion Modules, page 1-20
- Data Ports, page 1-23
- Power Supplies, page 1-23
- Fan Modules, page 1-25

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- Transceivers and Cables, page 1-26

Features

The Cisco Nexus 5548UP switch is a 10-Gigabit Ethernet and FCoE switch that offers up to 960-Gbps throughput and up to 48 ports. The switch has 32 fixed 1- or 10-Gbps SFP+ Ethernet and FCoE ports and one expansion slot. The expansion slot supports GEMs that offer 16 10-Gigabit Ethernet ports, eight 10-Gigabit Ethernet ports and eight 10-Gigabit FCoE ports, or 16 10-Gigabit Ethernet/FCoE ports. This switch has an orange lable with “Cisco Nexus 5548UP” above the Cisco logo on the front of the chassis.

The Cisco Nexus 5548P switch is a 10-Gigabit Ethernet switch that offers up to 960-Gbps throughput and up to 48 ports. The switch has 32 fixed 1- or 10-Gbps SFP+ Ethernet and FCoE ports and one expansion slot. The expansion slot supports GEMs that offer 16 10-Gigabit Ethernet ports or eight 10-Gigabit Ethernet ports and eight 10-Gigabit FCoE ports. This switch has a gray label with “Cisco Nexus 5548P” above the Cisco logo on the front of the chassis.

As a top-of-rack switch, all the servers in the rack connect to the Cisco Nexus 5548UP or Cisco Nexus 5548P switch, and it connects to the LAN or SAN.

The Cisco Nexus 5548UP and 5548P switches have the following features:

- One slot on the back of the switch for a Generic Expansion Module (GEM). Two slots on the front of the switch for hot swap-capable power supplies.
- Two slots on the front of the switch for hot swap-capable fan modules. You can insert four fans per module, which gives you a total of eight fans.
- One slot at the front of the switch for a USB port.
- Front-to-back cooling that supports efficient data center hot and cold-aisle designs.

Chassis

The Cisco Nexus 5548 switch chassis is 1 RU, 1.72 inches (4.4 cm) tall, 17.3 inches (43.9 cm) wide, and 29.5 inches (74.9 cm) deep. It is designed to be mounted in a standard 19-inch (48.26 cm) rack. The switch has two power supplies and two fans modules on the front of the switch. The switch also has one USB port (usb1:) at the front of the switch. This external USB flash memory is installed in a supervisor module used for storing image files, configuration files, and other miscellaneous files. You can create directories on external flash memory and navigate through these directories. You can also create and access files.

The usb1: port usage on the Cisco Nexus 5548 switch is the same as that on other Cisco NX-OS devices. (For details, see http://www.cisco.com/en/US/docs/switches/datacenter/sw/5_x/nx-os/fundamentals/configuration/guide/Cisco_Nexus_7000_Series_NX-OS_Fundamentals_Configuration_Guide_Release_5.x_chapter7.htm)

Thirty-two fixed 10-Gigabit Ethernet ports and expansion modules are at the rear of the switch. The front of the switch has an indicator LED, maagement ports, 2 fan modules and 2 power supplies as shown in Figure 1-16.

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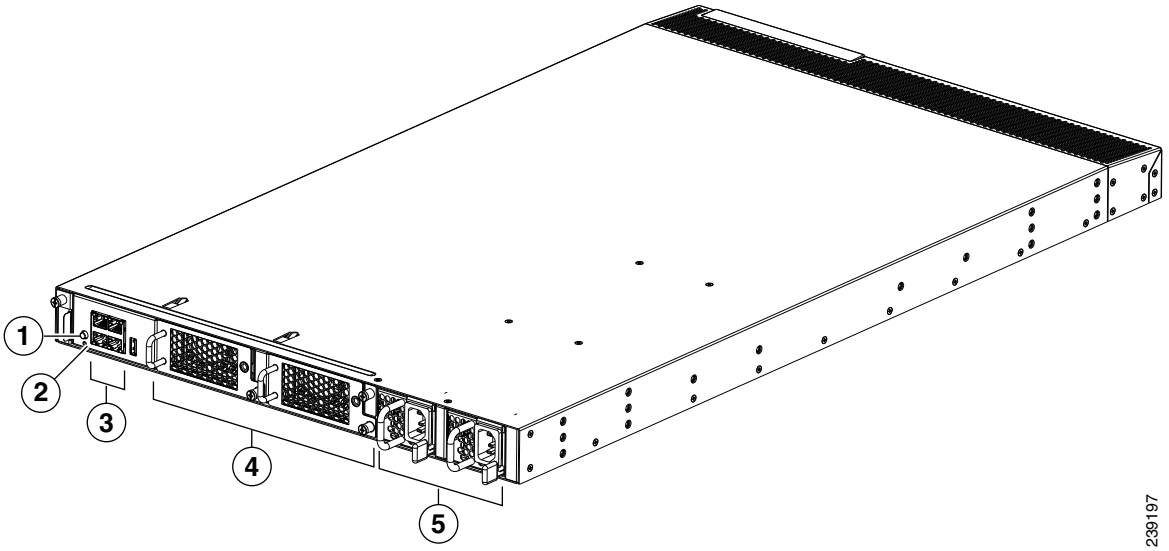
Figure 1-16 Cisco Nexus 5548 Switch Front View



1	ID LED	**4**	Two fan modules
2	Status LED	**5**	Two power supplies
3	Management (10/100/1000) ports, console port, and USB port		

The rear of the Cisco Nexus 5548 switch chassis has 32 fixed 10-Gigabit ports and 1 slot for an optional expansion module. On the Cisco Nexus 5548UP switch, the 32 fixed ports are 10-Gigabit Ethernet and FCoE ports (port numbering is shown with an orange label). On the Cisco 5548P switch, the 32 fixed ports are 10-Gigabit Ethernet ports (port numbering is shown with a gray label). Figure 1-17 shows the rear of the Cisco Nexus 5548 switch.

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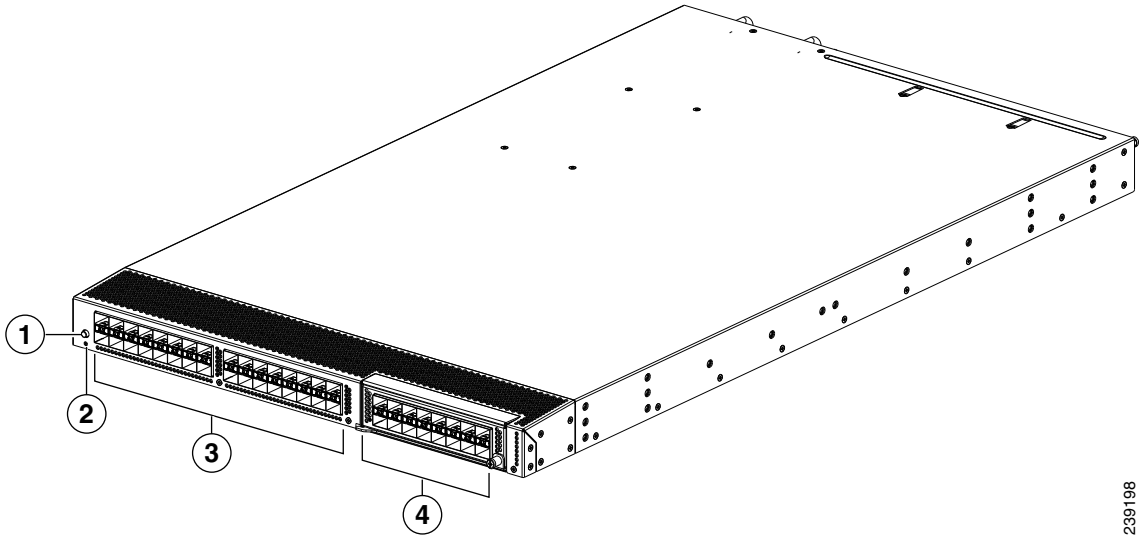
Figure 1-17 Cisco Nexus 5548 Switch Rear View



1	ID LED	**3**	32 fixed 10-Gigabit Ethernet/FCoE ports (Cisco Nexus 5548UP) or 32 fixed 10-Gigabit Ethernet ports (Cisco Nexus 5548P)
2	Status LED	**4**	Expansion module

Note The L1/L2/Mgmt1 ports are not usable. They are disabled at this time

Expansion Modules

Expansion modules allow Cisco Nexus switches to be configured as cost-effective 10-Gigabit Ethernet switches and as I/O consolidation platforms with native Fibre Channel connectivity.

The Cisco Nexus 5500 Platform is equipped with expansion modules that you can use to increase the number of 10-Gigabit Ethernet and FCoE ports or connect to Fibre Channel SANs with 8-, 4-, 2-, or 1-Gbps Fibre Channel switch ports. The chassis supports hot swapping of the expansion modules.

The Cisco Nexus 5548 supports one of the following expansion modules:

- N55 M16P Generic Expansion Module, page 1-20
- N55 M8P8FP Generic Expansion Module, page 1-21
- N55 M16UP Generic Expansion Module, page 1-22

N55 M16P Generic Expansion Module

The N55 M16P Generic Expansion Module (GEM) provides 16 1- or 10-Gigabit Ethernet ports using the SFP+ transceiver.

Figure 1-18 shows the components that you use to install this expansion module.

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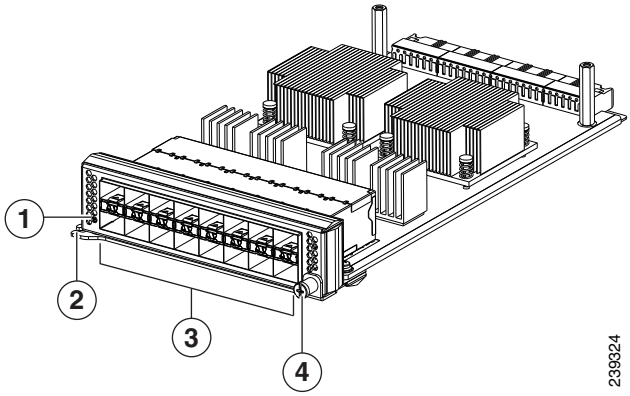
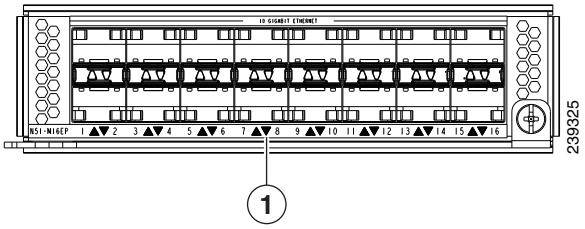
Figure 1-18 Components Used to Install the N55 M16P GEM



1	Status LED	**3**	16 10-Gigabit Ethernet ports
2	Ejector lever	**4**	Captive screw that locks the ejector lever

Figure 1-19 shows the front of the module and how its ports are numbered.

Figure 1-19 Port Numbering for the N55 M16P GEM



1	Port numbering from top to bottom and left to right		

N55 M8P8FP Generic Expansion Module

The N55 M8P8FP Generic Expansion Module (GEM) provides 8 1- or 10-Gigabit Ethernet and FCoE ports using the SFP+ interface and 8 ports of 8-, 4-, 2-, or 1-Gbps native Fibre Channel connectivity using the SFP interface.

Figure 1-20 shows the N55 M8P8FP expansion module.

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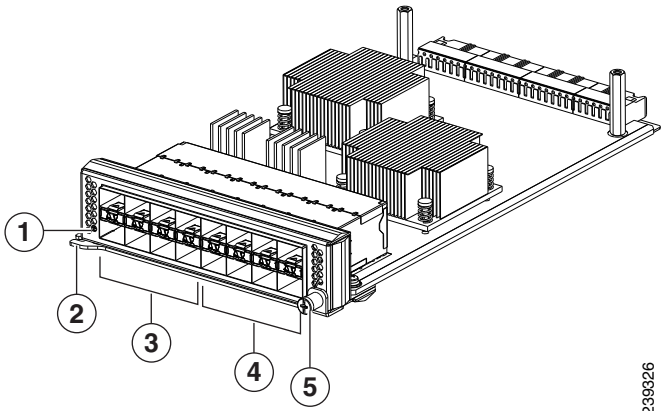
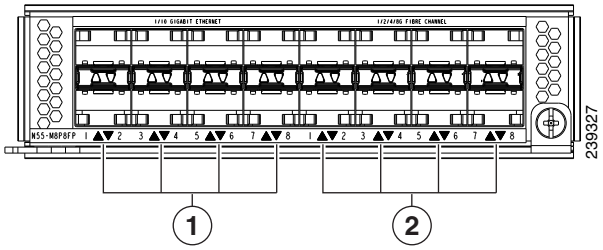
Figure 1-20 Components Used to Install the N55 M8P8FP GEM



1	Status LED	**4**	Eight 10-Gigabit FCoE ports
2	Ejector lever	**5**	Captive screw that locks the ejector lever
3	Eight 10-Gigabit Ethernet ports		

Figure 1-21 shows a front view of the N55 M8P8FP expansion module.

Figure 1-21 Port Numbering on the N55 M8P8FP GEM



1	Port numbering for Ethernet ports (from top to bottom and left to right)	**2**	Port numbering for FCoE ports (from top to bottom and left to right)

N55 M16UP Generic Expansion Module

The N55 M16UP Generic Expansion Module (GEM) provides 16 1- or 10-Gigabit Ethernet and FCoE ports using SFP+ transceivers.

Figure 1-22 shows the components that you use to install this expansion module.

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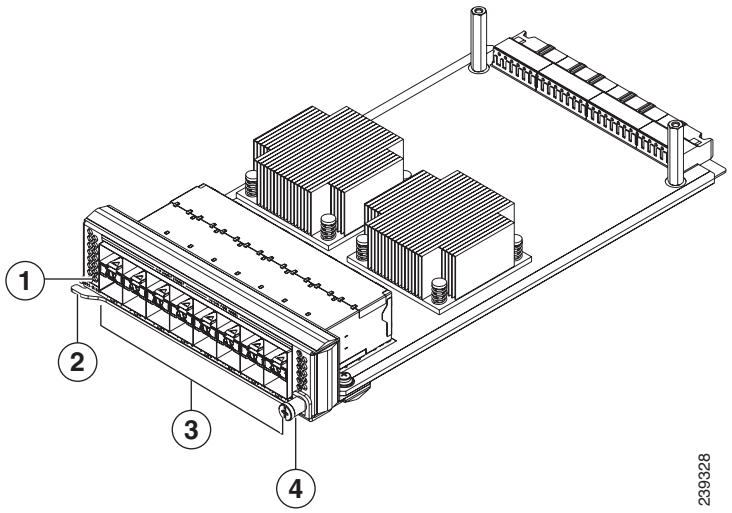
Figure 1-22 Components Used to Install the N55 M16UP GEM



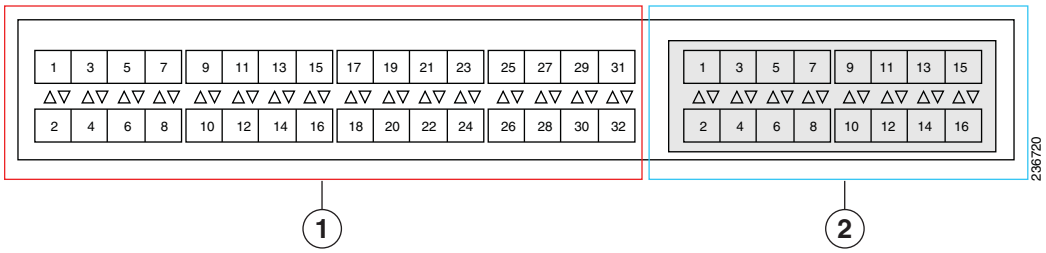
1	Status LED	**3**	16 10-Gigabit Ethernet and FCoE ports
2	Ejector lever	**4**	Captive screw that locks the ejector lever

The ports are numbered the same as with the N55-M16P GEM (see Figure 1-19 on page 1-21)

Data Ports

Each data port on the Cisco Nexus 5548 switch is numbered, and groups of ports are numbered based on their function. The ports are numbered from top to bottom and left to right.

Figure 1-23 Port Numbering of the Cisco Nexus 5548 Switch with an Expansion Module



1	32 fixed ports	**2**	16-port expansion module (N55 M16P, N55 M8P8FP, or N55 M16UP)

Power Supplies

The Cisco Nexus 5548 switch uses a front-end power supply. The chassis has slots for two power supplies. Two power supplies can be used for redundancy, but the Cisco Nexus 5548 switch is fully functional with one power supply. See Table 1-2 for the list of power supplies that you can order with the Cisco Nexus 5500 Platform switches.

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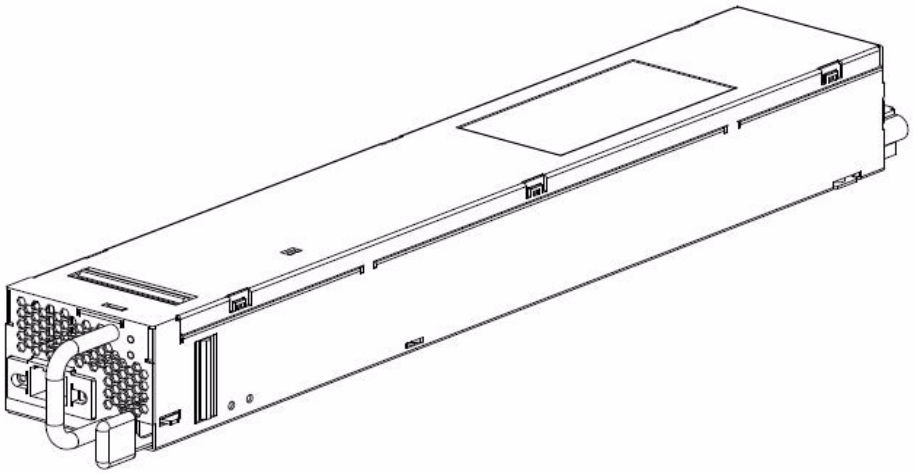
Table 1-2 Power Supplies for the Cisco Nexus 5500 Platform switches

Part Number	Power Supply
N55-PAC-750W(=)	Cisco Nexus 5548P/5548UP PSU Front-to-Back Airflow module spare, A/C, 100-240V, 750W
N55-PAC-750W-B(=)	Cisco Nexus 5548UP PSU Back-to-Front Airflow module spare, A/C, 100-240V, 750W
N55-PDC-750W(=)	Cisco Nexus 5548P/5548UP PSU Front-to-Back Airflow module spare, D/C, -40 to -72VDC, 750W
N55-PAC-1100W(=)	Cisco Nexus 5596UP PSU Front-to-Back Airflow module spare, A/C, 100-240V, 1100W
N55-PAC-1100W-B(=)	Cisco Nexus 5596UP PSU Back-to-Front Airflow module spare, A/C, 100-240V, 1100W

Figure 1-24 shows the 750W DC power supply. For specifications for this power supply, see Table B-10 on page B-4. For more information on the LEDs, see Table D-1 on page D-2

Figure 1-24 750 W DC Power Supply for the Cisco Nexus 5500 Series Switch



1	Handle	4	Ejector latch
2	FAIL (left) and OK (right) LEDs		
3	DC power receptacle		

Note Never leave a power supply slot empty. If you remove a power supply, replace it with another one. If you do not have a replacement power supply, leave the non functioning one in place until you can replace it.

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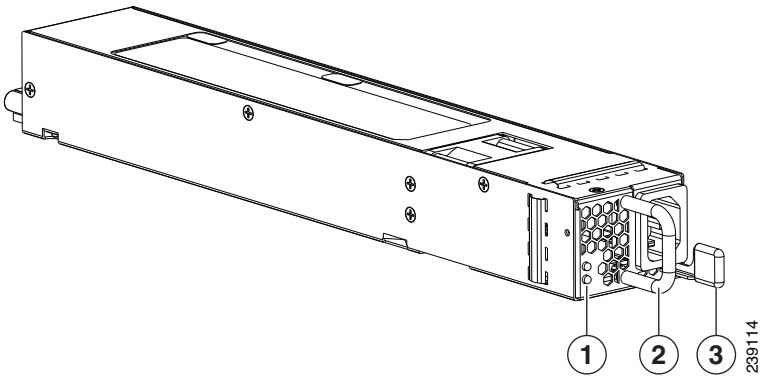
The Cisco Nexus 5548UP has front-to-back or back-to-front airflow. The Cisco Nexus 5548P has front-to-back airflow only. Figure 1-25 shows the AC power supply, with two LEDs: one for power status and one for failure condition.

Figure 1-25 AC Power Supply for the Cisco Nexus 5548 Switch



1	FAIL (top) and OK (bottom) LEDs	**3**	Release latch
2	Handle		

For information on each of the LEDs, see Table D-1 on page D-2. To see how combinations of these LED states indicate specific conditions, see the "Power Supply Conditions" section on page E-2.

Note Never leave a power supply slot empty. If you remove a power supply, replace it with another one. If you do not have a replacement power supply, leave the non functioning one in place until you can replace it.

For the specifications of this power supply, see Table B-11 on page B-4.

Caution The airflow direction should be the same for power suplies and fan modules.

Fan Modules

The Cisco Nexus 5548 switch requires two fan modules. Each fan module has four fans. If more than one fan fails in one of these modules, you must replace the module. Figure 1-26 identifies the components that you use to install or troubleshoot these modules.

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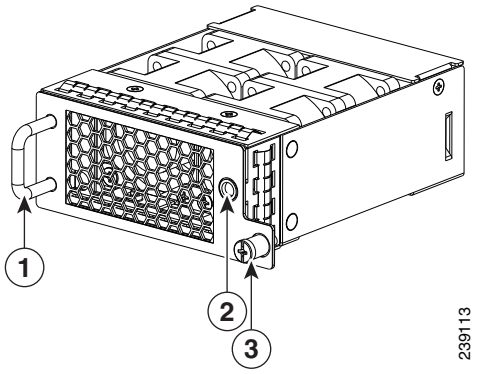
Figure 1-26 Cisco Nexus 5548 Fan Module



1	Handle	**3**	Captive screw
2	Bicolor LED (green or amber)		

The bicolor fan module LED indicates the fan tray health. Green indicates normal operation, while amber indicates a fan failure. For more information on this LED, see Table D-1 on page D-2. The Cisco Nexus 5548UP has front-to-back or back-to-front airflow. The Cisco Nexus 5548P has front-to-back airflow only.

Caution The airflow direction should be the same for power suplies and fan modules.

Transceivers and Cables

The Cisco Nexus 5548UP switch supports 10-Gigabit Ethernet and FCoE SFP+ and FET transceivers, and the Cisco Nexus 5548P switch supports 10-Gigabit Ethernet SFP+ and FET transceivers. The expansion modules support 1- and 10-Gigabit Ethernet SFP+ transceivers (N55 M16P expansion module), 10-Gigabit FET transceivers, and Fiber Channel SFP transceivers.

This section includes the following topics:

- Transceivers, page 1-26
- Cables, page 1-28

Transceivers

Table 1-3 lists the supported transceiver options.

Table 1-3 Supported Transceivers

Cisco SFP	Description
FET-10G	10G SFP+ module for Cisco Nexus 2000 Series to Cisco Nexus 5000 Series connectivity
Cisco SFP-10G-SR	10GBASE-SR SFP+ module (multimode fiber [MMF])
Cisco SFP-10G-LR	10GBASE-LR SFP+ module (single-mode fiber [SMF])

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Table 1-3 Supported Transceivers (continued)

Cisco SFP	Description
Cisco SFP-H10GB-CU1M	10GBASE-CU SFP+ cable 1 m (Twinax cable)
Cisco SFP-H10GB-CU3M	10GBASE-CU SFP+ cable 3 m (Twinax cable)
Cisco SFP-H10GB-CU5M	10GBASE-CU SFP+ cable 5 m (Twinax cable)
Cisco GLC-T	1000BASE-T SFP
Cisco GLC-SX-MM	GE SFP, LC connector SX transceiver (MMF)
Cisco GLC-LH-SM	GE SFP, LC connector LX/LH transceiver (SMF)
Cisco SFP-GE-T	1000BASE-T SFP, extended temperature range
Cisco SFP-GE-S	GE SFP, LC connector SX transceiver (MMF), extended temperature range and digital optical monitoring (DOM)
Cisco-SFP-GE-L	GE SFP, LC connector LX/LH transceiver (SMF), extended temperature range and DOM
Cisco DS-SFP-FC4G-SW	4-Gbps Fibre Channel SW SFP, LC (for Fibre Channel expansion module ports)
Cisco DS-SFP-FC4G-LW	4-Gbps Fibre Channel LW SFP, LC (for Fibre Channel expansion module ports)
Cisco DS-SFP-FC8G-SW	8-Gbps Fibre Channel SW SFP+, LC (for Fibre Channel expansion module ports)
Cisco DS-SFP-FC8G-LW	8-Gbps Fibre Channel LW SFP+, LC (for Fibre Channel expansion module ports)

This section includes the following topics:

- SFP+ Transceivers, page 1-27
- SFP+ Copper Cables, page 1-28
- SFP Fibre Channel Transceivers, page 1-28
- Cables, page 1-28

SFP+ Transceivers

The enhanced small-form-factor pluggable (SFP+) 10-Gigabit Ethernet transceiver module (see Table 1-4) is a bidirectional device with a transmitter and receiver in the same physical package. It has a 20-pin connector on the electrical interface and duplex LC connector on the optical interface.The Cisco Nexus 5548 switch supports the following SFP+ optical transceivers:

- SR
- LR (for uplink only)

Table 1-4 SFP+ Transceivers

Model	Description
SFP-10G-SR	10-Gigabit Ethernet—Short range SFP+ module
SFP-10G-LR	10-Gigabit Ethernet—Long range SFP+ module

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SFP+ Copper Cables

Copper cables are available for use with the 10-Gigabit Ethernet SFP+ module (see Table 1-5). The cables come in the following lengths:

- 1 m, 30 AWG
- 3 m, 28–30 AWG
- 5 m, 26–28 AWG
-

Table 1-5 SFP+ Copper Cables

Model	Description
SFP-H10GB-CU1M	10GBASE-CU SFP+ cable (1 meter)
SFP-H10GB-CU3M	10GBASE-CU SFP+ cable (3 meters)
SFP-H10GB-CU5M	10GBASE-CU SFP+ cable (5 meters)

SFP Fibre Channel Transceivers

The Cisco Nexus 5548 switch supports the multimode 850-nm, 4-Gbps SFPs with 150-m reach (see Table 1-6).

Table 1-6 SFP Fibre Channel Transceivers

Model	Description
DS-SFP-FC4G-SW	4-Gbps Fibre Channel-SW SFP, LC
DS-SFP-FC4G-LW	4-Gbps Fibre Channel-LW SFP, LC, (10-km reach)
Cisco DS-SFP-FC8G-SW	8-Gbps Fibre Channel SW SFP+, LC
Cisco DS-SFP-FC8G-LW	8-Gbps Fibre Channel LW SFP+, LC

Cables

On the Cisco Nexus 5500 Platforms, you can use an innovative Twinax copper cable that connects to standard SFP+ connectors for in-rack use and on the optical cable for longer cable runs.

For in-rack or adjacent-rack cabling, the Cisco Nexus 5500 Platform supports SFP+ direct-attach 10-Gigabit Ethernet copper, which integrates transceivers with Twinax cables into an energy efficient, low-cost, and low-latency solution. SFP+ direct-attach 10-Gigabit Twinax copper cables use only 0.1 W of power per transceiver and introduce only approximately 0.25 microsecond of latency per link.

For longer cable runs, the Cisco Nexus 5500 Platform supports multimode, short-reach optical SFP+ transceivers. These optical transceivers use approximately 1 W per transceiver and have a latency of less than 0.1 microsecond.

Table 1-7 shows details of the cables supported.

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Table 1-7 Supported Cables

Connector (Media)	Cable	Distance	Power (each side)	Transceiver Latency (Link)	Standard
SFP+ CU copper	Twinax	5 m	Approx. 0.1 W	~ 0.1 microseconds	SFF 8431
SFP+ ACU copper	Active Twinax	7 m/ 10 m	Approx. 0.5 W	~ 6.8 nanoseconds	SFF 8461
SFP+ SR MMF and SR	MM OM2 MM OM3	82 m/ 300 m	1 W	~ 0 microseconds	IEEE 802.3ae

Cisco Nexus 5000 Platform Switches

The Cisco Nexus 5000 Platform switches include the Cisco Nexus 5020 switch and the Cisco Nexus 5010 switch.

This section includes the following topics:

- Cisco Nexus 5020 Switch, page 1-29
- Cisco Nexus 5010 Switch, page 1-40

Cisco Nexus 5020 Switch

This section describes the Cisco Nexus 5020 switch. This section includes the following sections:

- Features, page 1-29
- Chassis, page 1-30
- Expansion Modules, page 1-32
- Ports, page 1-35
- Power Supply, page 1-37
- Fan Modules, page 1-38
- Transceivers, page 1-39

Features

The Cisco Nexus 5020 switch is a 2 RU, top-of-rack switch that provides Ethernet and Fibre Channel consolidation in a single physical cable. The Fibre Channel over Ethernet (FCoE) protocol is used to consolidate Ethernet and Fibre Channel traffic onto the same physical connection between the server and the switch. As a top-of-rack switch, all the servers in the rack connect to the Cisco Nexus 5020 switch, and it connects to the LAN or SAN.

The Cisco Nexus 5020 switch is a part of a family of switches that provide 10-Gigabit Ethernet and FCoE ports and both 10-Gigabit Ethernet and native 4-, 2-, or 1-Gbps Fibre Channel ports. The switches provide consolidated I/O connectivity to both production Ethernet LANs and Fibre Channel SANs in a cost-effective, high-performance, low-latency Ethernet switch.

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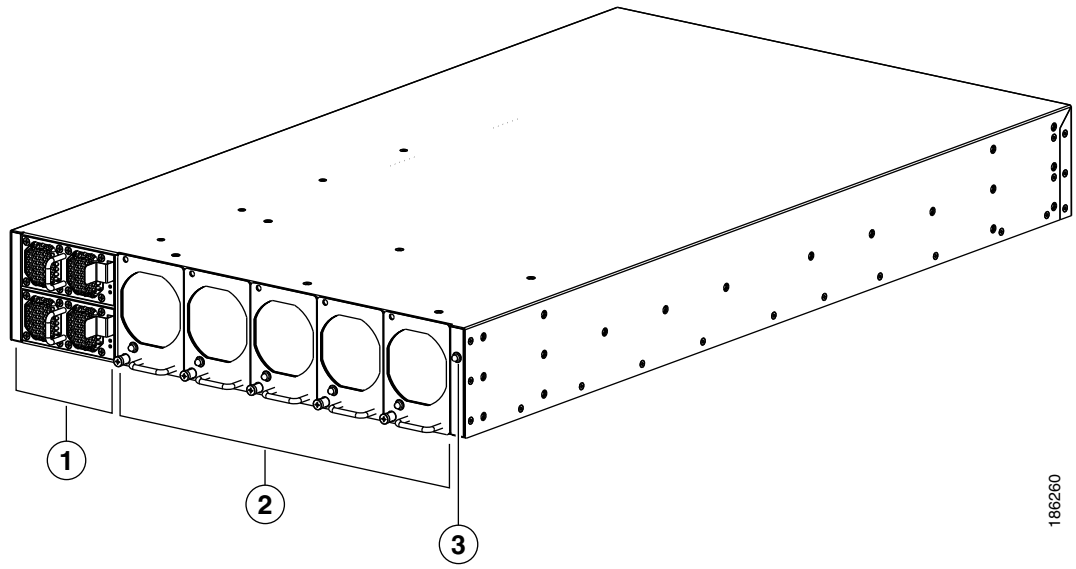
The Cisco Nexus 5020 switch has the following features:

- Forty fixed 10-Gigabit Ethernet server connection ports on the back of the switch
- Two slots for optional 10-Gbps expansion modules or Fibre Channel interfaces on the back of the switch
- Two slots on the front of the switch for hot swap-capable power supplies
- Five slots on the front of the switch for hot swap-capable fan modules, each of which houses two fans, that provide front-to-back cooling for the switch
- The L1/L2/Mgmt1 ports are not usable. They are disabled at this time

Chassis

The Cisco Nexus 5020 chassis is 2 RU (3.47 inches) tall, 17.3 inches wide, and 30.0 inches deep. It is designed to be mounted in a standard 19-inch rack. The switch has two power supplies and five fan modules on the front of the switch. Ports are at the rear of the switch. The airflow is front to back so it must be positioned with the front side in a cold isle. Figure 1-27 shows the front of the Cisco Nexus 5020 switch.

Figure 1-27 Cisco Nexus 5020 Switch Front View



1	Two power supplies	**3**	System status LED
2	Five fan modules		

The rear of the Cisco Nexus 5020 chassis has 40 fixed 10-Gigabit Ethernet ports, 2 slots for optional expansion modules, an Ethernet connector with 2 cross-connect ports and 2 management ports, a console port, and 2 AC power connectors as shown in Figure 1-28.

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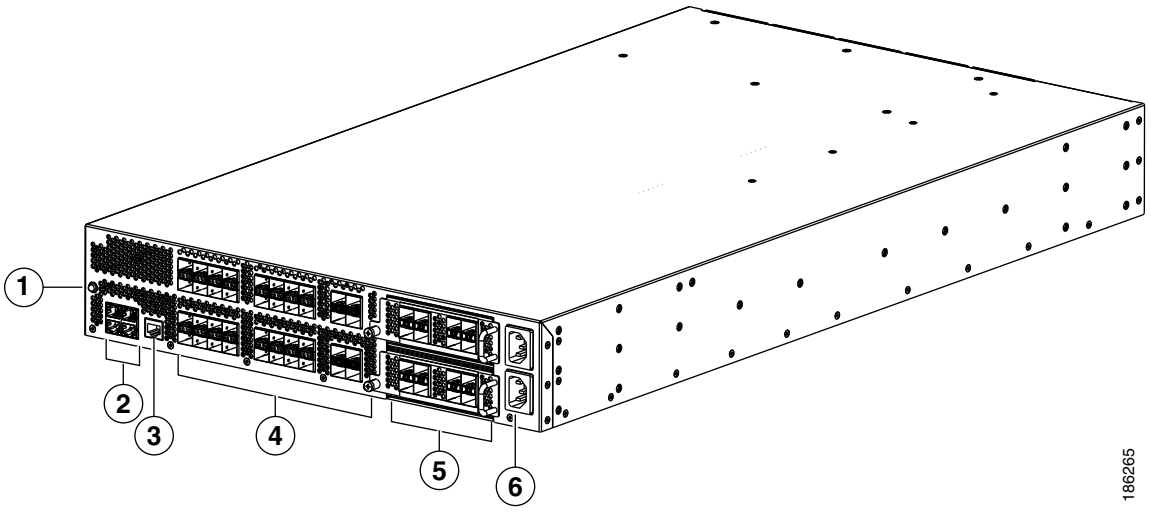
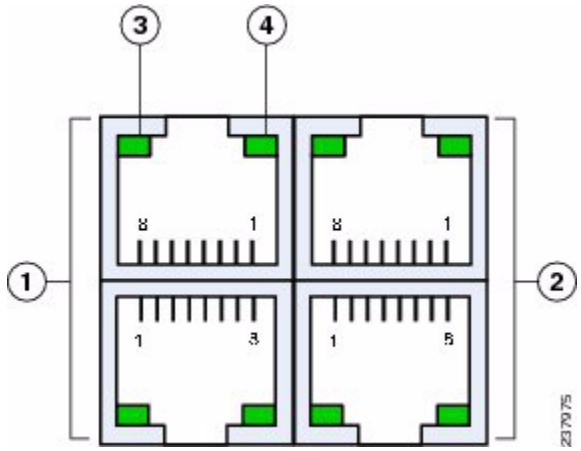
Figure 1-28 Cisco Nexus 5020 Switch Rear View



1	System status LED	**4**	40 fixed 10-Gigabit Ethernet ports
2	Two cross-connect ports on the left (top and bottom) and two network management ports on the right (top and bottom)	**5**	Expansion modules, shown here with two 4-port Fibre Channel plus 4-port, 10-Gigabit Ethernet expansion modules
3	Console port	**6**	AC power connectors

The Ethernet connector port exposes four Ethernet ports that are in a 2 x 2 stacked RJ-45 jack. Figure 1-29 shows a close-up view of the Ethernet connector port.

Figure 1-29 Cross-Connect and Network Management Ports



1	Internal cross-connect ports (two)	**3**	Link LED (left LED)
2	Network management ports (two)	**4**	Activity LED (right LED)

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To see what each of the Ethernet port LEDs indicate, see Table D-3 on page D-4.

Expansion Modules

The Cisco Nexus 5020 switch has two slots that can be used for the following optional expansion modules:

- Fibre Channel plus Ethernet expansion module
- Ethernet expansion module
- N5K-M1008 Generic Expansion Module (GEM)
- N5K-M1060 GEM

The chassis supports hot swapping of the expansion modules.

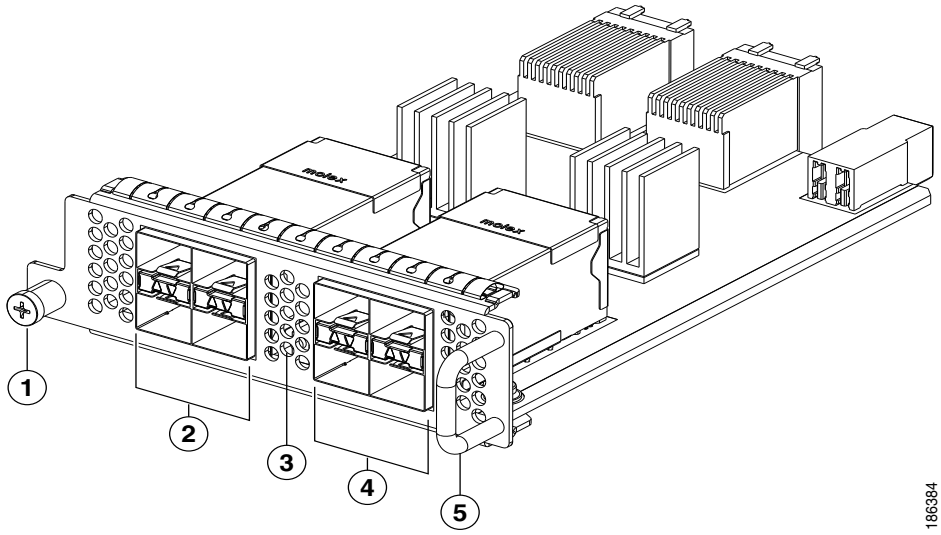
This section includes the following topics:

- Fibre Channel Plus Ethernet Expansion Module, page 1-32
- Ethernet Expansion Module, page 1-33
- N5K-M1008 Generic Expansion Module, page 1-34
- N5K-M1060 Generic Expansion Module, page 1-34

Fibre Channel Plus Ethernet Expansion Module

The Fibre Channel plus Ethernet expansion module is a field-replaceable unit (FRU) that supports four SFP+ transceiver modules and four 4-, 2-, or 1-Gbps Fibre Channel transceivers. Figure 1-30 shows the features that you use when installing the Fibre Channel plus Ethernet expansion module.

Figure 1-30 Fibre Channel Plus Ethernet Expansion Module Features



1	Captive screw	**4**	Four 4-, 2-, and 1- Gbps Fibre Channel ports
2	Four 10-Gigabit Ethernet ports	**5**	Handle
3	Status LED		

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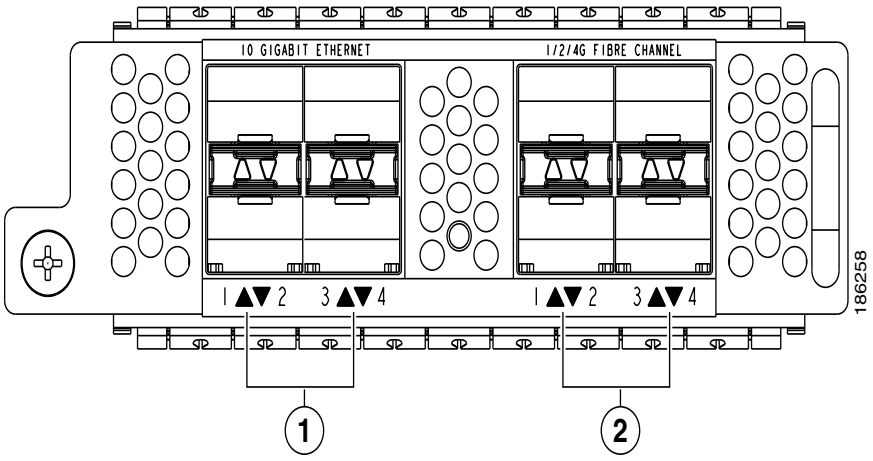
Figure 1-31 shows the Ethernet and Fibre Channel ports are numbered.

Figure 1-31 Front View of the Fibre Channel Plus Ethernet Expansion Module

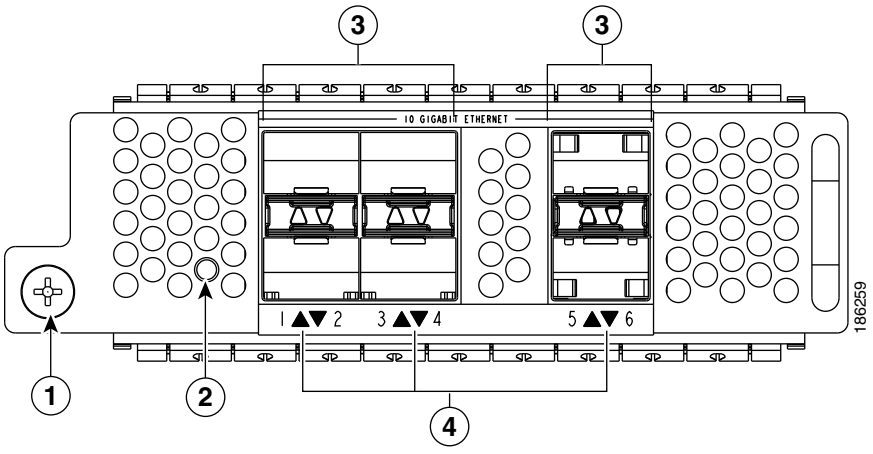


1	Port numbering for the Ethernet ports	**2**	Port numbering for the Fibre Channel ports

Ethernet Expansion Module

The Ethernet expansion module is a field-replaceable unit (FRU) that supports six 10-Gigabit Ethernet ports, four of which have encryption capability. Figure 1-32 shows the features used when installing this expansion module.

Figure 1-32 Ethernet Expansion Module



1	Captive screw	**4**	Port numbering for the Ethernet ports
2	Status LED	**5**	Handle
3	10-Gigabit Ethernet ports		

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N5K-M1008 Generic Expansion Module

The N5K-M1008 GEM supports 8 4-, 2-, or 1-Gbps Fiber Channel, SFP-based uplink connections. Figure 1-33 shows the features used when installing this expansion module.

Figure 1-33 N5K-M1008 GEM

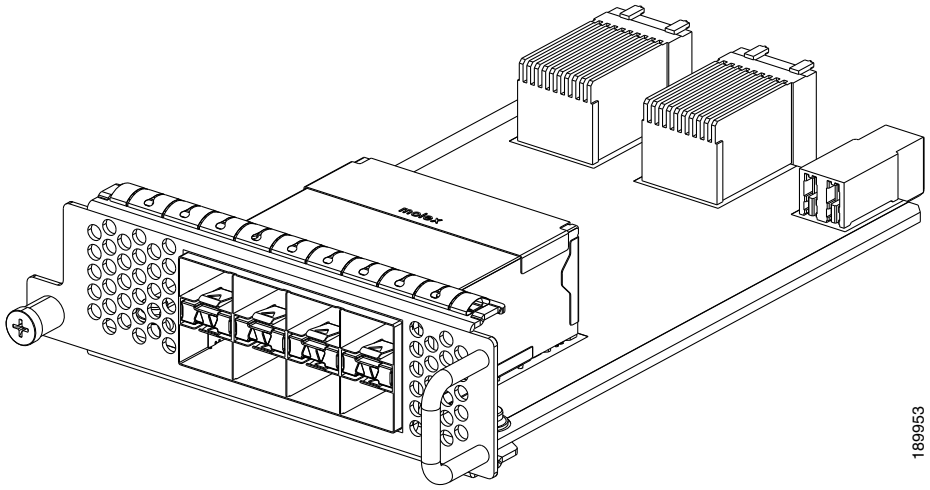
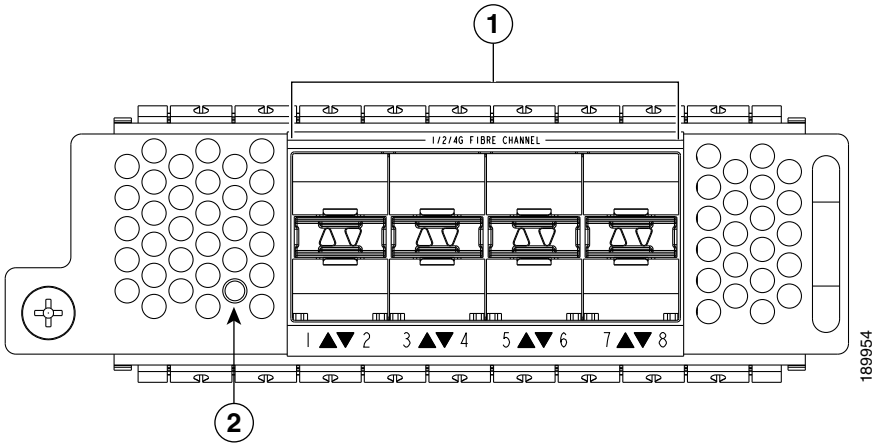


Figure 1-34 Front View of the N5K-M1008 GEM



1	Eight 4-, 2-, or 1-Gbps Fibre Channel ports	**2**	LED

N5K-M1060 Generic Expansion Module

The N5K-M1060 expansion module provides 6 EA 8-, 4-, 2-, or 1-Gbps line rate Fiber Channel, SFP+ based uplink connections. Figure 1-35 and Figure 1-36 show the N5K-M1060 GEM.

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Figure 1-35 N5K-M1060 GEM

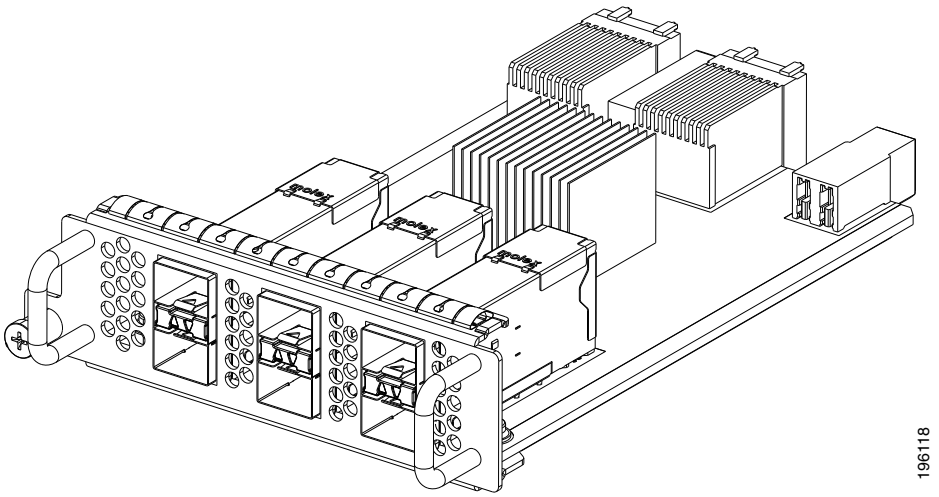
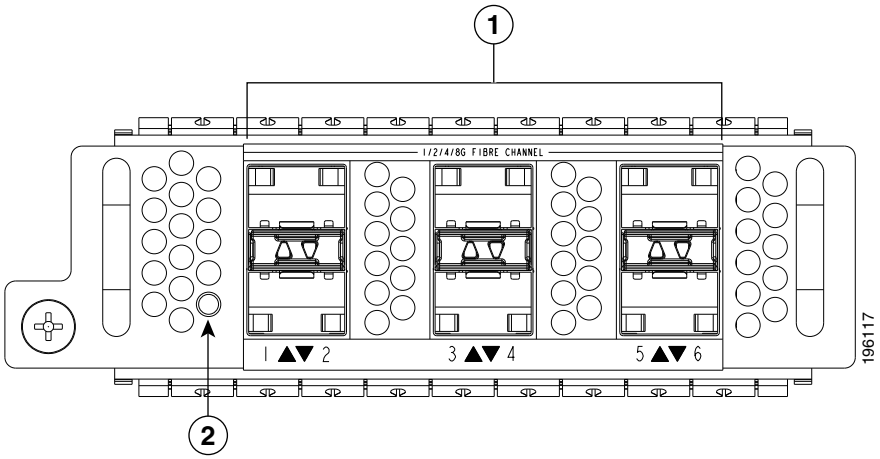


Figure 1-36 Front View of the N5K-M1060 GEM



1	Six 8-, 4-, 2-, or 1-Gbps Fibre Channel ports	**2**	LED

Ports

Each individual port on the Cisco Nexus 5020 switch is numbered, and groups of ports are numbered based on their function. The ports are numbered top to bottom and left to right. The 40 fixed ports form group 1 and are named 1/*port_number*. Ports 1 through 32 are unencrypted Ethernet ports. Of these, ports 1 through 16 are 10-Gigabit Ethernet and 1-Gigabit Ethernet-capable ports. Ports 33 through 40 are encryption-capable Ethernet ports.

Group 2 includes the ports in the top-most expansion module. Group 2, ports 1 through 4, are encrypted Ethernet ports. Group 2, ports 5 through 8, are Fibre Channel ports.

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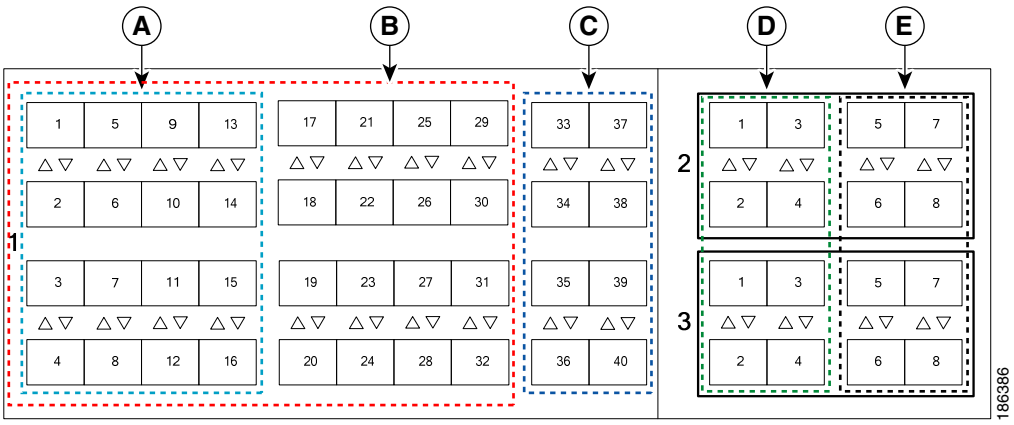
Group 3 includes the ports in the bottom-most expansion module. Group 3 ports 1 through 4 are encrypted Ethernet ports. Group 3 ports 5 through 8 are Fibre Channel ports.

Figure 1-37 shows how ports are numbered and grouped by function for both the fixed ports and the Fibre Channel plus Ethernet expansion module ports.

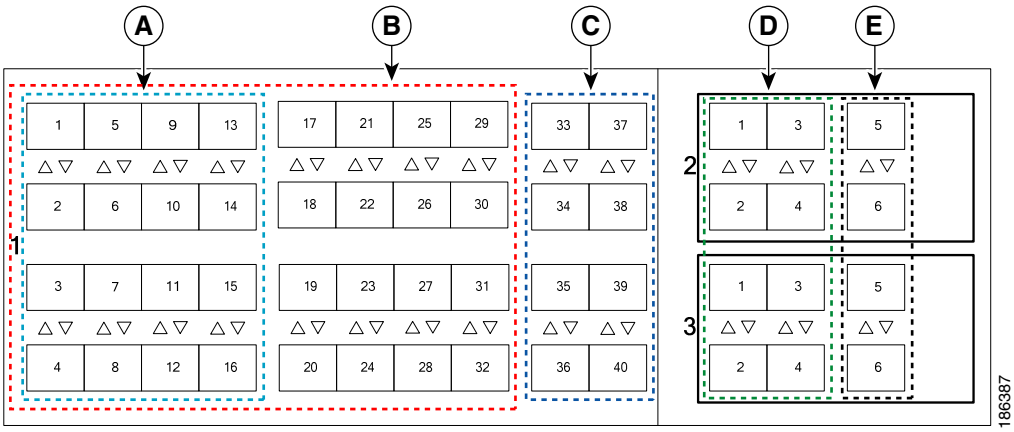
Figure 1-37 Port Numbering of Fixed Ports and Fibre Channel Plus Ethernet Expansion Module Ports



A	Group 1, ports 1 through 16: 10-Gigabit Ethernet and 1-Gigabit Ethernet capable unencrypted ports	**D**	Groups 2 and 3, ports 1 through 4: Encrypted Ethernet ports
B	Group 1, ports 1 through 32: Unencrypted Ethernet ports	**E**	Groups 2 and 3, ports 5 through 8: Fibre Channel ports
C	Group 1, ports 33 through 40: Encrypted Ethernet ports		

Figure 1-38 shows how ports are numbered and grouped by function for both the fixed ports and the Ethernet expansion module ports.

Figure 1-38 Port Numbering of Fixed Ports and the Ethernet Expansion Module



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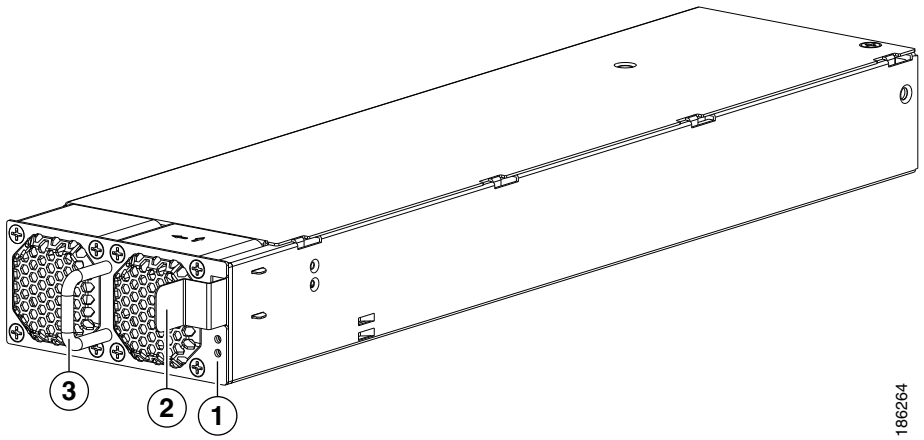
A	Group 1, ports 1 through 16: 10-Gigabit Ethernet and 1-Gigabit Ethernet-capable Encrypted ports	**D**	Groups 2 and 3, ports 1 through 4: Encrypted Ethernet ports
B	Group 1, ports 1 through 32: Unencrypted Ethernet ports	**E**	Groups 2 and 3, ports 5 through 6: Unencrypted Ethernet ports
C	Group 1, ports 33 through 40: Encrypted Ethernet ports		

Power Supply

The Cisco Nexus 5020 switch uses a front-end power supply with front to back airflow. The chassis has slots for two power supplies. Two power supplies can be used for redundancy, but the Cisco Nexus 5020 switch is fully functional with one power supply. Figure 1-39 shows the power supply, which has two LEDs: one for the power status and one for the failure condition.

Figure 1-39 Power Supply for the Cisco Nexus 5020 Switch



1	FAULT (top) and OK (bottom) LEDs	**3**	Handle
2	Release lever		

For descriptions of the LEDs, see Table D-1 on page D-2. For descriptions of power supply conditions indicated by the LEDs, see Table D-2 on page D-3.

If you have one power supply installed in the chassis, but the other power supply slot is empty, you should use a power supply blank panel to cover the empty slot. Figure 1-40 shows a blank power supply panel.

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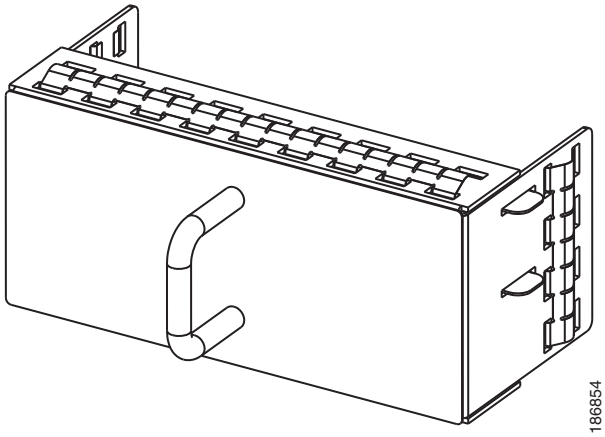
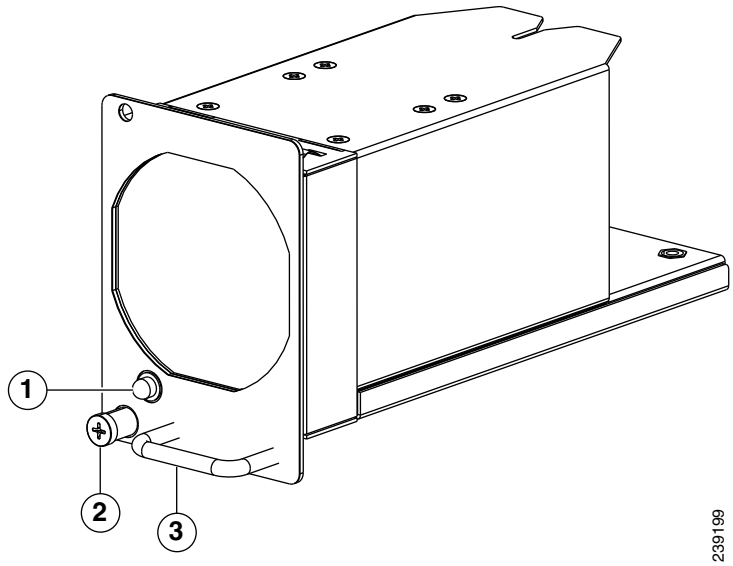
Figure 1-40 Blank Power Supply Panel



Fan Modules

The Cisco Nexus 5020 switch has five fan modules each with front to back airflow. Figure 1-41 shows a fan module.

Figure 1-41 Cisco Nexus 5020 Fan Module



1	Fan module LED	**3**	Handle
2	Captive screw		

The bicolor fan module LED indicates the fan tray health. Green indicates normal operation, while amber indicates a fan failure.

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Transceivers

The Cisco Nexus 5020 switch supports both SFP+ Ethernet transceivers and SFP Fibre Channel transceivers.

This section includes the following sections:

- SFP+ Transceivers, page 1-39
- SFP+ Copper Cables, page 1-39
- SFP Fibre Channel Transceivers, page 1-40

SFP+ Transceivers

The enhanced SFP+ 10-Gigabit Ethernet transceiver module is a bidirectional device with a transmitter and receiver in the same physical package (see Table 1-8). It has a 20-pin connector on the electrical interface and duplex LC connector on the optical interface.The Cisco Nexus 5020 switch supports the SFP-10G-SR transceiver.

Table 1-8 SFP+ Transceivers

Model	Description
SFP-10G-SR	10-Gigabit Ethernet—Short range SFP+ module

SFP+ Copper Cables

Copper cables are available for use with the 10-Gigabit Ethernet SFP+ module. The cables come in the following lengths:

- 1 m, 30 AWG
- 3 m, 28–30 AWG
- 5 m, 26–28 AWG

Table 1-9 SFP+ Copper Cables

Model	Description
SFP-H10GB-CU1M	10GBASE-CU SFP+ Cable (1 meter)
SFP-H10GB-CU3M	10GBASE-CU SFP+ Cable (3 meters)
SFP-H10GB-CU5M	10GBASE-CU SFP+ Cable (5 meters)

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SFP Fibre Channel Transceivers

The Cisco Nexus 5020 switch also supports the following SFP Fibre Channel transceivers (see Table 1-10):

Table 1-10 SFP Fibre Channel Transceiver

Model	Description
DS-SFP-FC4G-SW	4-, 2-, or 1-Gbps Fibre Channel—short wavelength SFP module

Cisco Nexus 5010 Switch

This section describes the Cisco Nexus 5010 switch and its components. This section includes the following topics:

- Features, page 1-40
- Chassis, page 1-41
- Expansion Modules, page 1-42
- Ports, page 1-47
- Power Supplies, page 1-48
- Fan Modules, page 1-49
- Transceivers, page 1-50

Features

The Cisco Nexus 5010 switch is a top-of-rack switch that provides Ethernet and Fibre Channel consolidation in a single physical cable. The Fibre Channel over Ethernet (FCoE) protocol is used to consolidate Ethernet and Fibre Channel traffic onto the same physical connection between the server and the switch. As a top-of-rack switch, all the servers in the rack connect to the Cisco Nexus 5010 switch, and it connects to the LAN or SAN.

The Cisco Nexus 5010 switch is a part of a family of switches that provide 10-Gigabit Ethernet and FCoE ports and both 10-Gigabit Ethernet and native 4-, 2-, or 1-Gbps Fibre Channel ports. The switches provide consolidated I/O connectivity to both production Ethernet LANs and Fibre Channel SANs in a cost-effective, high-performance, low-latency Ethernet switch.

The Cisco Nexus 5010 switch has the following features:

- One slot on the back of the switch for an optional uplink Generic Expansion Module [GEM]. The following modules can be inserted into this slot: N5K-M1404, N5K-M1600 and N5K-M1008.
- There are 20 to 28 ports on the back of the switch depending on which GEM is installed. Twenty ports on Cisco Nexus 5010 switch belong to the base switch. Additionally, you can insert a module with six or eight ports.
- Two slots on the front of the switch for hot swap-capable power supplies.
- Two slots on the front of the switch for fan modules. Each fan module houses six fans. The combination of six fans per module and two modules provides the switch with a total of 12 fans.
- The L1/L2/Mgmt1 ports are not usable. They are disabled at this time

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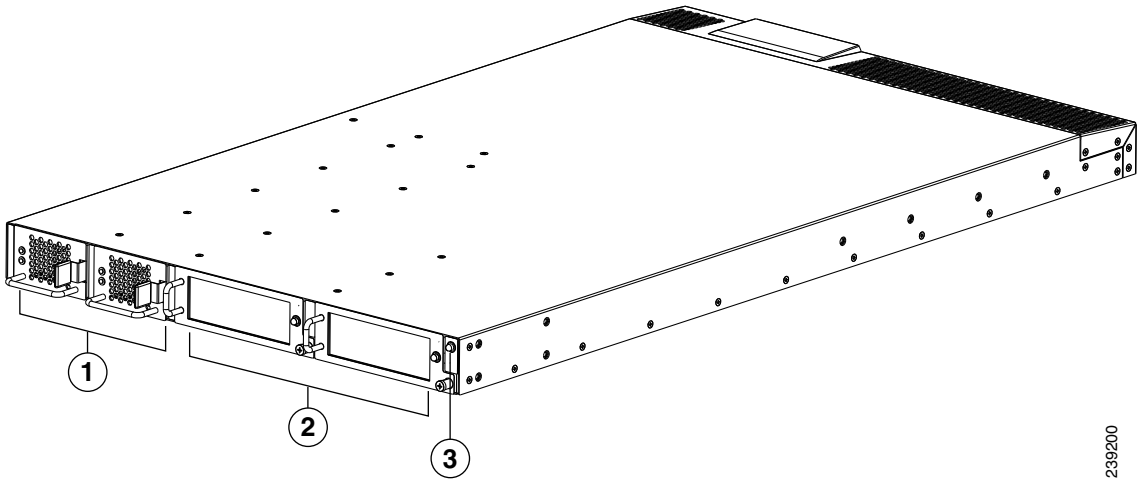
Chassis

The Cisco Nexus 5010 chassis is 1 RU, 1.72 inches (4.37 cm) tall, 17.3 inches (43.94 cm) wide, and 30.0 inches (76.2 cm) deep. It is designed to be mounted in a standard 19-inch rack. The switch has two power supplies and two fan modules on the front of the switch. Ports are at the rear of the switch. The airflow is front to back. Figure 1-42 shows the front view of the Cisco Nexus 5010 switch. The airflow is front-to-back, which means you must position the switch with its front endin a cold isle.

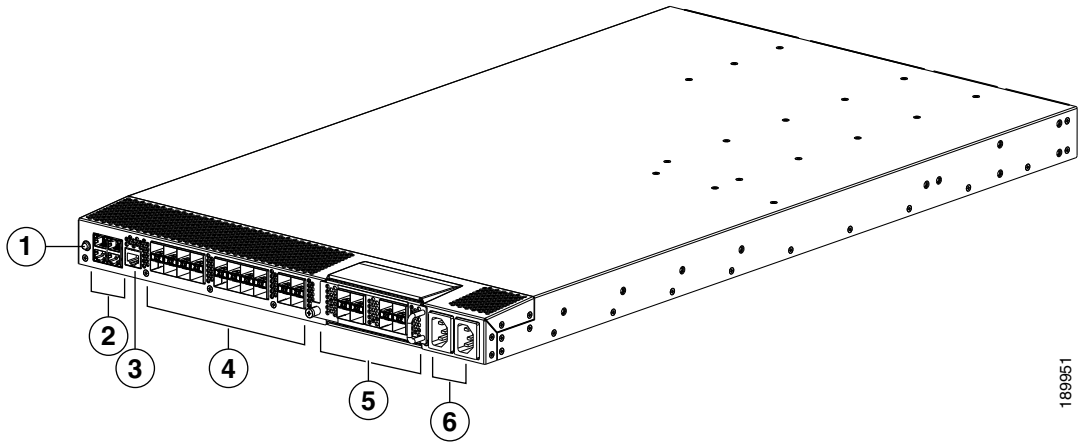
Figure 1-42 Cisco Nexus 5010 Switch Front View



1	Two power supplies	**3**	System status LED
2	Two fan modules		

The rear of the Cisco Nexus 5010 chassis has 20 fixed 10-Gigabit Ethernet ports, 1 slot for an optional expansion module, an Ethernet connector with 2 cross-connect ports and 2 management ports, a console port, and 2 AC power connectors. Figure 1-43 shows the rear of the Cisco Nexus 5010 switch.

Figure 1-43 Cisco Nexus 5010 Switch Rear View



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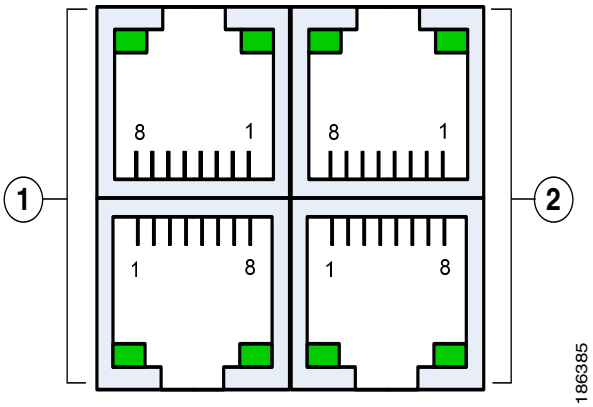
1	System status LED	**4**	20 fixed 10-Gigabit Ethernet ports
2	Two cross-connect ports on the left (top and bottom) and two network management ports on the right (top and bottom)	**5**	Expansion modules
3	Console port	**6**	AC power connectors

The cross-connect and network-management ports are in a 2 x 2 stacked set of RJ-45 jacks. Figure 1-44 shows a close-up view of the these ports.

Figure 1-44 Cross-Connect and Network-Management Ports



1	Internal cross connect ports	**2**	Network management ports

For information on the Ethernet LEDs, see Table D-3 on page D-4.

Expansion Modules

Expansion modules allow Cisco Nexus 5000 Platform switches to be configured as cost-effective, 10-Gigabit Ethernet switches and as I/O consolidation platforms with native Fibre Channel connectivity. The Cisco Nexus 5010 switch has one slot for an optional uplink Generic Expansion Module (GEM). The following modules can be inserted in this slot: N5K-M1404, N5K-M1600, N5K-M1008 and N5K-M1060.

- N5K-M1404 provides 4 10G SFP+, and 4 Fibre Channel 4-, 2-, or 1-Gbps SFP-based uplink connections. The 10-Gigabit Ethernet ports are encryption capable.
- M5K-M1600 provides 6 10G SFP+ based uplink connections.
- N5K-M1008 provides 8 4-, 2-, or 1-Gbps Fibre Channel, SFP based uplink connection.
- N5K-M1060 provides 6 8-, 4-, 2-, or 1-Gbps line rate Fibre Channel, SFP+ based uplink connections.

The chassis supports hot swapping of the expansion modules.

This section includes the following topics:

- N5K-M1404 Generic Expansion Module, page 1-43

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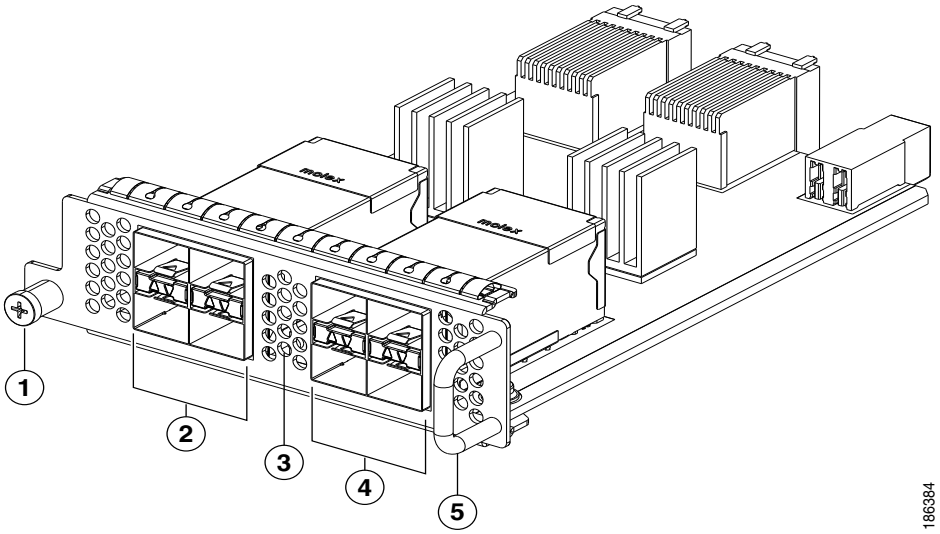
- N5K-M1600 Generic Expansion Module, page 1-44
- N5K-M1008 Generic Expansion Module, page 1-45
- N5K-M1060 Generic Expansion Module, page 1-46

N5K-M1404 Generic Expansion Module

The N5K-M1404 GEM supports four SFP+ transceiver modules and four 4-, 2-, or 1-Gbps Fibre Channel transceivers. The N5K-M1404 Fibre Channel plus Ethernet expansion module is a field-replaceable unit (FRU). Figure 1-45 shows the Fibre Channel plus Ethernet expansion module.

Figure 1-45 N5K-M1404 Generic Expansion Module



1	Captive screw	**4**	Four 4-, 2-, and 1- Gbps Fibre Channel ports
2	Four 10-Gigabit Ethernet ports	**5**	Handle
3	Status LED		

Figure 1-7 shows how ports are numbered on the module.

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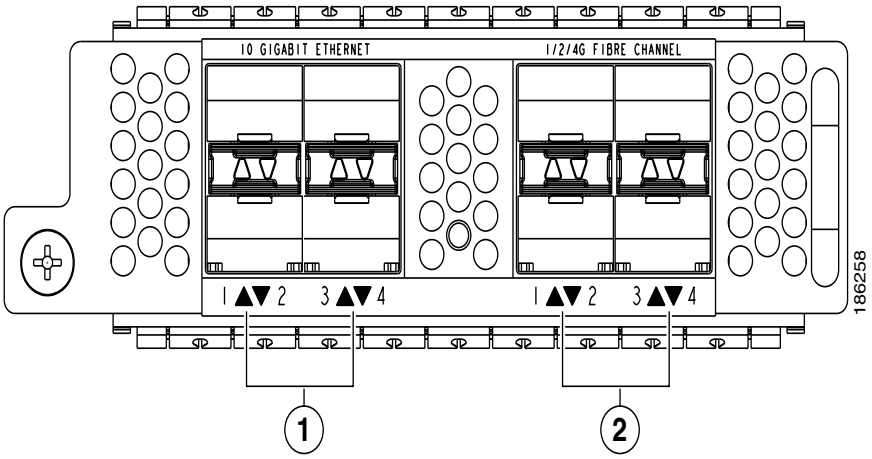
Figure 1-46 Front of the N5K-M1404 GEM

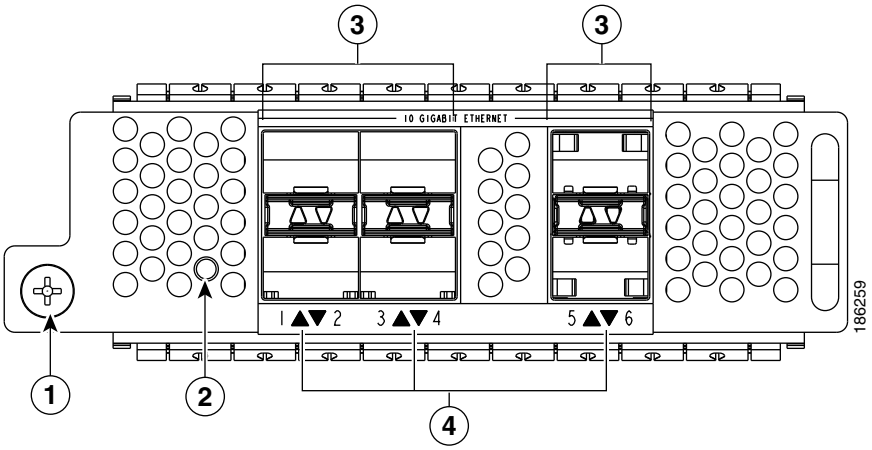


1	Port numbering for the four 10-Gigabit Ethernet ports	**2**	Port numbering for the four 4-, 2-, or 1- Gbps Fibre Channel ports

N5K-M1600 Generic Expansion Module

The N5K-M1600 GEM supports 6 10-Gbps, SFP+ based uplink connections. Figure 1-47 shows the N5K-M1600 GEM.

Figure 1-47 N5K-M1600 GEM



1	Captive screw	**3**	Six 10-Gbps Ethernet ports
2	Status LED	**4**	Port numbering for the Ethernet ports (odd numbered ports above even numbered ports)

See Figure 1-38 for an illustration of how ports are grouped and numbered on the Ethernet expansion module.

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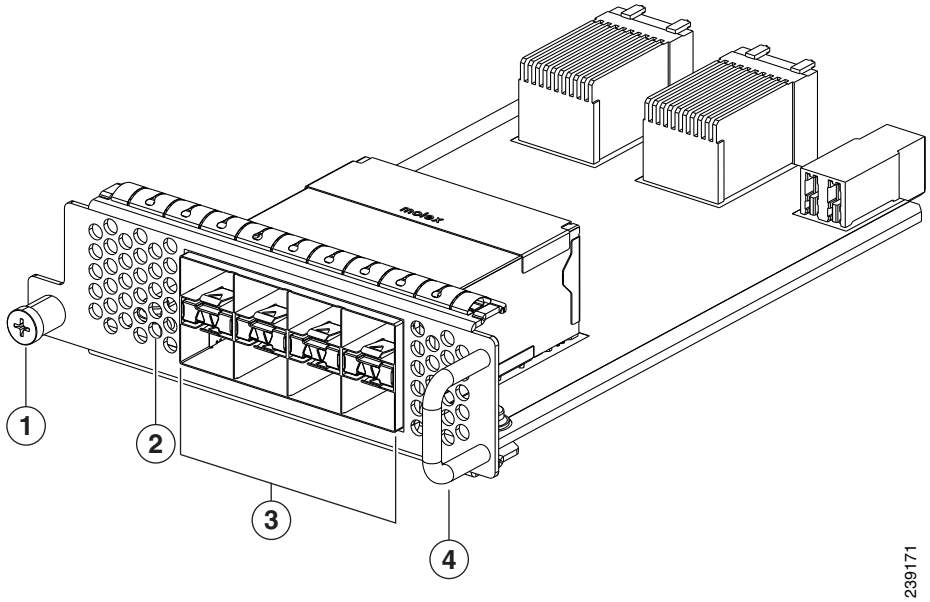
N5K-M1008 Generic Expansion Module

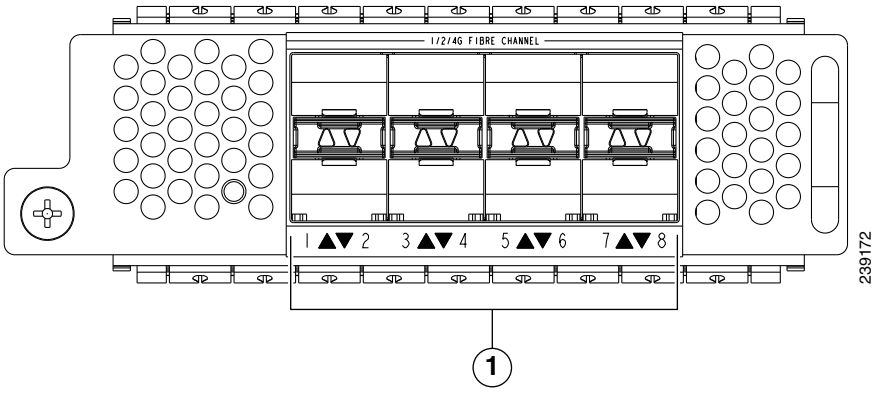
The N5K-M1008 GEM supports eight 4-, 2-, or 1-Gbps Fibre Channel, SFP-based uplink connections. Figure 1-48 shows the features used to install this module and Figure 1-49 shows how the ports are numbered.

Figure 1-48 N5K-M1008 GEM



1	Captive screw	3	Eight 4-, 2-, or 1-Gbps Fibre Channel ports
2	Status LED	4	Handle

Figure 1-49 Front View of the N5K-M1008 GEM



1	Port numbering (odd numbered ports on top and even numbered ports on bottom)		

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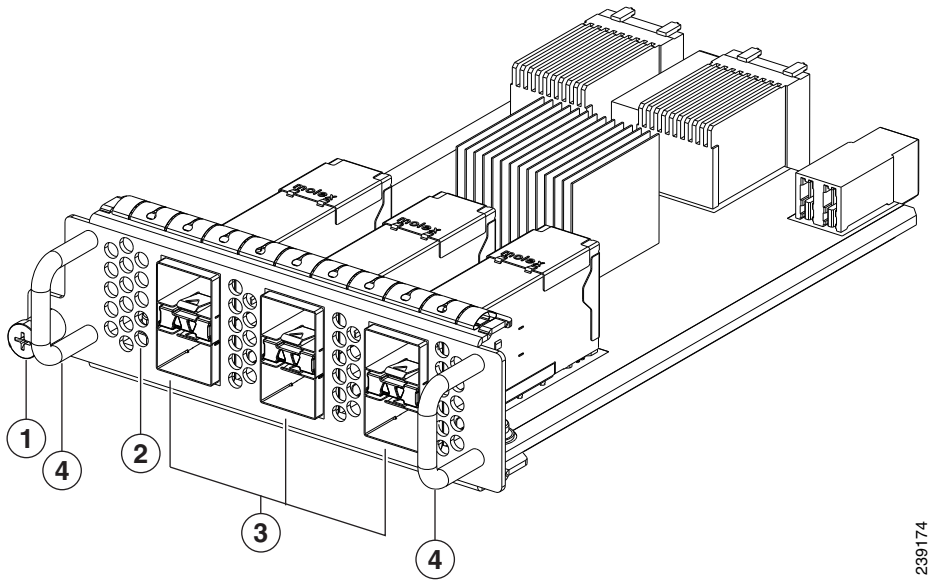
N5K-M1060 Generic Expansion Module

The N5K-M1060 expansion module provides six 8-, 4-, 2-, or 1-Gbps line rate Fibre Channel, SFP+ based uplink connections. Figure 1-50 shows this module and the features used to install it.

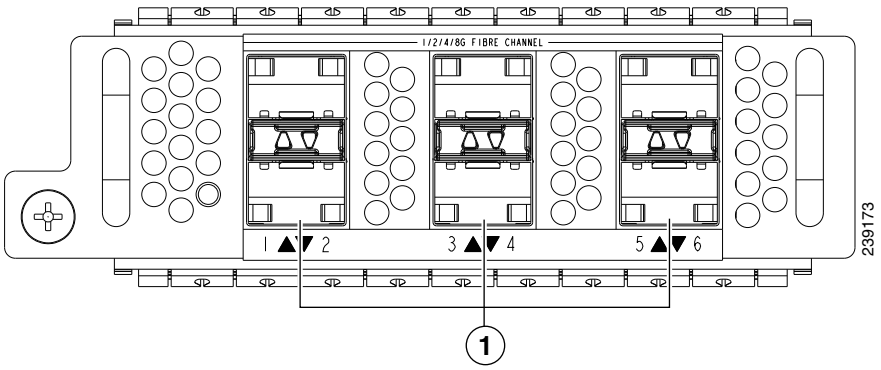
Figure 1-50 N5K-M1060 GEM



1	Captive screw	**3**	Six 8-, 4-, 2-, or 1-Gbps Fibre Channel ports
2	Status LED	**4**	Handle

Figure 1-51 shows how the ports are numbered on this module.

Figure 1-51 Front of the N5K-M1060 GEM



1	Port numbering (odd numbered ports on top and even numbered ports on bottom)		

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Ports

Each individual port on the Cisco Nexus 5010 switch is numbered, and groups of ports are numbered based on their function. The ports are numbered top to bottom and left to right.

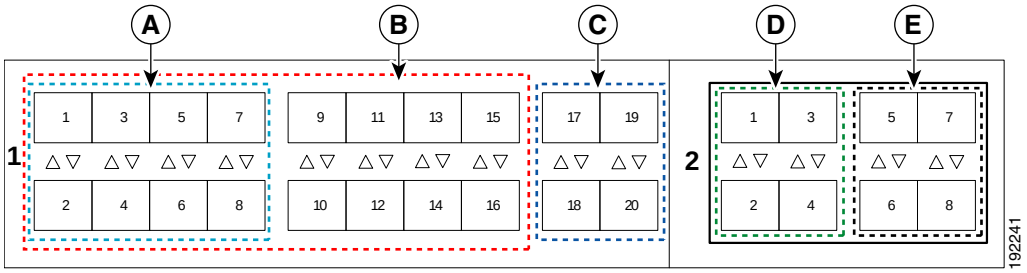
There are 20 to 28 ports on the Cisco Nexus 5010 switch, depending on which GEM is installed.

The 20 fixed ports form group 1 and are named 1/*port_number*. Ports 1 through 16 are unencrypted Ethernet ports. Ports 1 through 8 are 10-Gigabit Ethernet and 1-Gigabit Ethernet-capable ports. Ports 17 through 20 are encryption-capable Ethernet ports.

Group 2 includes the ports in the GEM module. Group 2, ports 1 through 4, are encrypted Ethernet ports. Group 2, ports 5 through 8, are Fibre Channel ports.

Figure 1-52 shows how ports are numbered and grouped by function with the N5K-M1404 GEM installed.

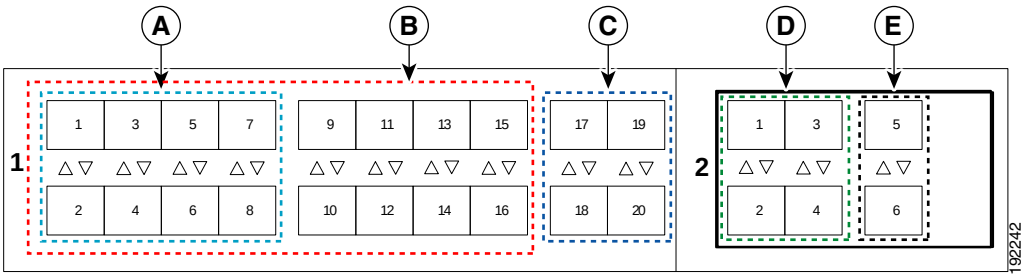
Figure 1-52 Port Numbering of the Cisco Nexus 5010 Switch with the N5K-M1404 GEM



A	Group 1, ports 1 through 8: 10-Gigabit Ethernet and 1-Gigabit Ethernet-capable unencrypted ports	**D**	Group 2, ports 1 through 4: Encrypted Ethernet ports
B	Group 1, ports 1 through 16: Unencrypted Ethernet ports	**E**	Group 2, ports 5 through 8: Fibre Channel ports
C	Group 1, ports 17 through 20: Encrypted Ethernet ports		

Figure 1-53 shows how ports are numbered and grouped by function with the N5K-M1600 GEM installed.

Figure 1-53 Port Numbering of the Cisco Nexus 5010 Switch with the N5K-M1600 GEM



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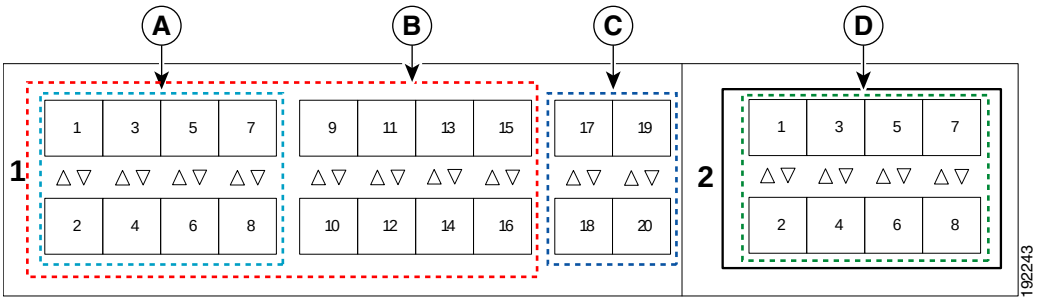
A	Group 1, ports 1 through 8: 10-Gigabit Ethernet and 1-Gigabit Ethernet-capable unencrypted ports	**D**	Group 2, ports 1 through 4: Encrypted Ethernet ports
B	Group 1, ports 1 through 16: Unencrypted Ethernet ports	**E**	Group 2, ports 5 and 8: Unencrypted Ethernet ports
C	Group 1, ports 17 through 20: Encrypted Ethernet ports		

Figure 1-54 shows how ports are numbered and grouped by function with the N5K-M1008 GEM installed.

Figure 1-54 Port Numbering of the Cisco Nexus 5010 Switch with the N5K-M1008 GEM



A	Group 1, ports 1 through 8: 10-Gigabit Ethernet and 1-Gigabit Ethernet capable unencrypted ports	**C**	Group 1, ports 17 through 20: Encrypted Ethernet ports
B	Group 1, ports 1 through 16: Unencrypted Ethernet ports	**D**	Group 2, ports 1 through 8: Fibre Channel ports

Power Supplies

The Cisco Nexus 5010 switch uses a front-end power supply with front to back airflow. The chassis has slots for two power supplies. Two power supplies can be used for redundancy, but the Cisco Nexus 5010 switch is fully functional with one power supply. Figure 1-55 shows the power supply, which has two LEDs: one for power status and one for failure condition.

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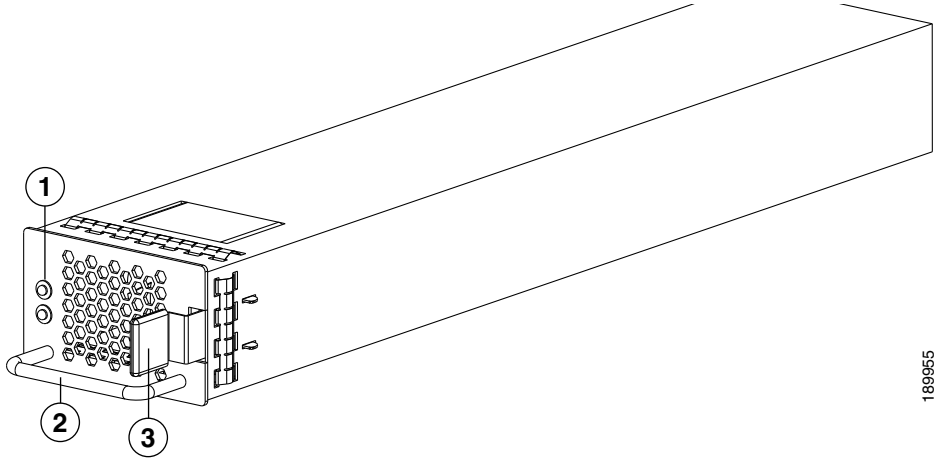
Figure 1-55 Power Supply for the Cisco Nexus 5010 Switch

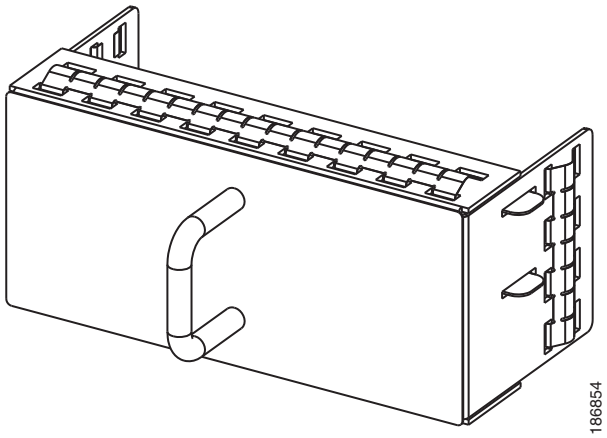


1	FAIL (top) and OK (bottom) LEDs	**3**	Release latch
2	Handle		

For information on the LEDs see Table D-1 on page D-2. To see what combinations of these LEDs indicate, see Table D-2 on page D-3.

If you have one power supply installed in the chassis, but the other power supply slot is empty, you should use a blank panel to cover the empty slot. Figure 1-56 shows a blank power supply panel.

Figure 1-56 Blank Power Supply Panel



Fan Modules

The Cisco Nexus 5010 switch has slots for two fans modules. Each fan module houses six fans and each uses front to back airflow. If you insert 2 fan modules (with 6 fans in each module), your switch will have a total of 12 fans. Figure 1-26 shows the fan module.

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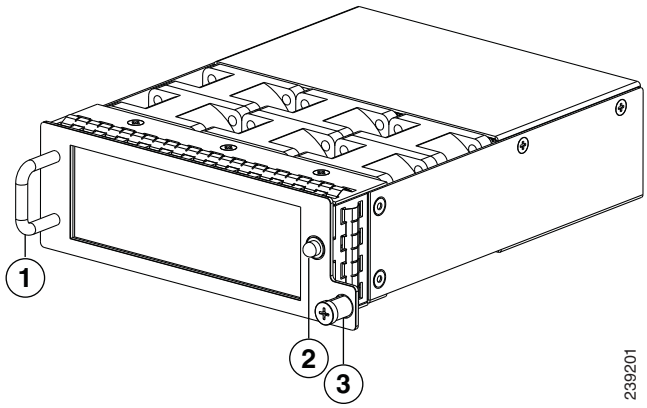
Figure 1-57 Cisco Nexus 5010 Fan Module



1	Handle	**3**	Captive screw
2	Fan module LED		

The bicolor fan module LED indicates the fan tray health. Green indicates normal operation, while amber indicates a fan failure.

Transceivers

The Cisco Nexus 5010 switch supports both SFP+ Ethernet transceivers and SFP Fibre Channel transceivers.

This section includes the following topics:

- SFP+ Transceivers, page 1-50
- SFP+ Copper Cables, page 1-51
- SFP Fibre Channel Transceivers, page 1-51

SFP+ Transceivers

The enhanced SFP+ 10-Gigabit Ethernet transceiver module is a bidirectional device with a transmitter and receiver in the same physical package. It has a 20-pin connector on the electrical interface and duplex LC connector on the optical interface. The Cisco Nexus 5010 switch supports the following SFP+ optical transceivers:

- SR
- LR (for uplink only)

Table 1-11 SFP+ Transceivers

Model	Description
SFP-10G-SR	10-Gigabit Ethernet—Short range SFP+ module
SFP-10G-LR	10-Gigabit Ethernet—Long range SFP+ module

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SFP+ Copper Cables

Copper cables are available for use with the 10-Gigabit Ethernet SFP+ module (seeTable 1-12). The cables come in the following lengths:

- 1 m, 30 AWG
- 3 m, 28–30 AWG
- 5 m, 26–28 AWG

Table 1-12 SFP+ Copper Cables

Model	Description
SFP-H10GB-CU1M	10GBASE-CU SFP+ cable (1 meters)
SFP-H10GB-CU3M	10GBASE-CU SFP+ cable (3 meters)
SFP-H10GB-CU5M	10GBASE-CU SFP+ cable (5 meters)

SFP Fibre Channel Transceivers

The Cisco Nexus 5010 switch supports the multimode 850-nm 4-Gbps SFP with 150-m reach (see Table 1-13).

Table 1-13 SFP Fiber Channel Transceivers

Model	Description
DS-SFP-FC4G-SW	4-Gbps Fibre Channel-SW SFP, LC
DS-SFP-FC4G-LW	4-Gbps Fibre Channel-LW SFP, LC, (10-km reach)

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CHAPTER 2

Installing the Cisco Nexus 5000 Series Switches

This chapter describes how to install the Cisco Nexus 5500 Platform switches and the Cisco Nexus 5000 Platform switches. This chapter includes the following sections:

- Preparing for Installation, page 2-2
- Installing the Switch, page 2-5
- Grounding the Switch, page 2-17
- Starting the Switch, page 2-25

Note Before you install, operate, or service the system, see the *Regulatory Compliance and Safety Information for the Cisco Nexus 5000 Family* for important safety information.

Warning **IMPORTANT SAFETY INSTRUCTIONS**

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device. Statement 1071

SAVE THESE INSTRUCTIONS

Warning **This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security.** Statement 1017

Warning **Only trained and qualified personnel must be allowed to install, replace, or service this equipment.** Statement 1030

Note Each new switch requires a license. For information on licensing, see the *Cisco NX-OS Licensing Guide*.

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Preparing for Installation

This section describes how to prepare the Cisco Nexus 5500 Platform switch or the Cisco Nexus 5000 Platform switch for installation. This section includes the following topics:

- Installation Options with Racks and Cabinets, page 2-2
- Airflow Direction, page 2-2
- Chassis Weight, page 2-2
- Installation Guidelines, page 2-3
- Required Equipment, page 2-4
- Unpacking and Inspecting the Switch, page 2-4

Installation Options with Racks and Cabinets

The Cisco Nexus 5500 Platform switches and the Cisco Nexus 5000 Platform switches can be installed in the following types of racks using a rack-mount kit shipped with the switch:

- Open EIA rack
- Perforated EIA cabinet

To enable you to easily mount your switch in any qualifying rack, you can attach the rack-mount brackets to accommodate racks of different depths. For instructions on how to use a rack-mount kit, see the "Installing the Switch" section on page 2-5.

Airflow Direction

The airflow through the fan trays and power supplies on the Cisco Nexus 5548 UP switch is either from front to back or from back to front, depending on how the modules were ordered. The airflow through the other Cisco Nexus 5000 Series switches is from front to back. To ensure proper airflow, you must make sure that when you install the switch its air intake is positioned in a cold aisle and the air exhaust is positioned in a hot aisle for your data center.

Chassis Weight

When lifting the switch chassis, follow these guidelines:

- Disconnect all power and external cables before lifting the switch.
- Have two people lift the switch. These switches have the following weights:
  - The Cisco Nexus 5596 switch weighs 50 lb (22.68 kg)
  - The Cisco Nexus 5548 switch weighs 32 lb (14.51 kg).
  - The Cisco Nexus 5020 switch weighs 50 lb (22.68 kg).
  - The Cisco Nexus 5010 switch weighs 35 lb (15.88 kg).
- Ensure that your footing is solid and the weight of the switch is evenly distributed between your feet.
- Lift the switch slowly, keeping your back straight. Lift with your legs, not with your back. Bend at the knees, not at the waist.

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Installation Guidelines

When installing the Cisco Nexus 5500 Platform switch or the Cisco Nexus 5000 Platform switch, follow these guidelines:

- Record the information listed in Appendix G, "Site Planning and Maintenance Records," as you install and configure the switch.
- Ensure that there is adequate space around the switch to allow for servicing the switch and for adequate airflow (Appendix B, "Technical Specifications," lists the service and airflow requirements).
- Ensure that the air-conditioning meets the heat dissipation requirements listed in Appendix B, "Technical Specifications."
- Ensure that the cabinet or rack meets the requirements listed in Appendix A, "Cabinet and Rack Installation."

Note Jumper power cords are available for use in a cabinet. See the "Jumper Power Cord" section on page C-9.

- Ensure that the chassis can be adequately grounded. If the switch is not mounted in a grounded rack, we recommend connecting both the system ground on the chassis and the power supply ground directly to an earth ground.
- Ensure that the site power meets the power requirements listed in Appendix B, "Technical Specifications." If available, you can use an uninterruptible power supply (UPS) to protect against power failures.

Caution Avoid UPS types that use ferroresonant technology. These UPS types can become unstable with systems such as the Cisco Nexus 5500 Platform switches or the Cisco Nexus 5000 Platform switches, which can have substantial current draw fluctuations because of fluctuating data traffic patterns.

- Ensure that circuits are sized according to local and national codes. For North America, the power supply requires a 15-A or 20-A circuit.

Caution To prevent loss of input power, ensure the total maximum loads on the circuits supplying power to the switch are within the current ratings for the wiring and breakers.

- Ensure that all fan trays and power supplies have the same airflow drection. All Cisco Nexus 5000 Series switches can be ordered with front to back airflow ad the Cisco Nexus 5548UP switch can alternatively have back to front airflow, which is identified with a black stripe on the switch.
- Use the following screw torques when installing the switch:
  - Captive screws: 4 in-lb (0.45 N·m)
  - M3 screws: 4 in-lb (0.45 N·m)
  - M4 screws: 12 in-lb (1.36 N·m)
  - 10-32 screws: 20 in-lb (2.26 N·m)
  - 12-24 screws: 30 in-lb (3.39 N·m)

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Required Equipment

Before beginning the installation, ensure that you have the following items available:

- Four 12-24 or 10-32 screws for attaching slider rails to the rack
- Number 1 and number 2 Phillips screwdrivers with torque capability
- 3/16-inch flat-blade screwdriver
- Tape measure and level
- ESD wrist strap or other grounding device
- Antistatic mat or antistatic foam

The following additional items (not found in the accessory kit) are required to ground the chassis:

- Grounding cable (6 AWG recommended), sized according to local and national installation requirements; the required length depends on the proximity of the switch to proper grounding facilities
- Crimping tool large enough to accommodate the girth of the lug
- Wire-stripping tool

Unpacking and Inspecting the Switch

Caution When handling switch components, wear an ESD strap and handle modules by their handles and carrier edges only. An ESD socket is provided on the chassis. For the ESD socket to be effective, the chassis must be grounded through the power cable, the chassis ground, or the metal-to-metal contact with a grounded rack.

Tip Keep the shipping container in case the chassis requires shipping in the future.

Note The switch is thoroughly inspected before shipment. If any damage occurred during transportation or any items are missing, contact your customer service representative immediately.

To inspect the shipment, follow these steps:

Step 1 Compare the shipment to the equipment list provided by your customer service representative and verify that you have received all items, including the following:

- Grounding lug kit
- Rack-mount kit
- ESD wrist strap
- Cables with connectors
- Any optional items ordered

Step 2 Check for damage and report any discrepancies or damage to your customer service representative. Have the following information ready:

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- Invoice number of shipper (see packing slip)
- Model and serial number of the damaged unit
- Description of damage
- Effect of damage on the installation

Installing the Switch

This section includes the following topics:

- Installing a Cisco Nexus 5596 Switch, page 2-5
- Installing the Cisco Nexus 5548 Switch, page 2-9
- Installing the Cisco Nexus 5020 Switch, page 2-11
- Installing the Cisco Nexus 5010 Switch, page 2-15

Installing a Cisco Nexus 5596 Switch

This section describes how to use the rack-mount kit provided with the switch to install the Cisco Nexus 5596UP switch or Cisco Nexus 5596T into a cabinet or rack that meets the requirements described in Appendix A, “Cabinet and Rack Installation.”

Note The Cisco Nexus 5596 has front to back airflow so you must position it with the front facing a cold isle.

Caution If the rack is on wheels, ensure that the brakes are engaged or that the rack is otherwise stabilized.

Table 2-3 lists the items contained in the rack-mount kit provided with the switch.

Table 2-1 Cisco Nexus 5596Switch Rack-Mount Kit

Quantity	Part Description
2	Rack-mount brackets
16	M4x0.7 x 8-mm Phillips countersunk screws
2	Rack-mount guides
2	Slider rails (22 inch minimum to a 36 inch maximum)

Note You must supply the eight 10-32 or 12-24 screws required to mount the rack brackets and slider rails to the rack. The rack-mount kit does not provide these screws.

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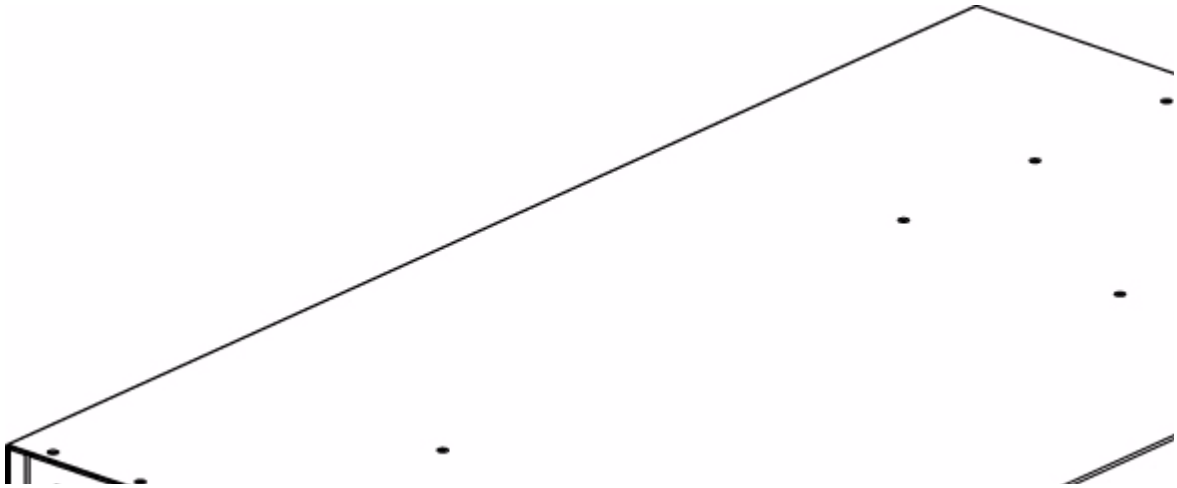
To install the switch in a rack or cabinet using the rack-mount kit provided with the switch, follow these steps:

Step 1 Install the front rack-mount brackets on the chassis as follows:

a. Position a front rack-mount bracket on the side of the chassis with its four holes aligned to four of the six screw holes on the front side of the chassis, and then use four M4 screws to attach the bracket to the chassis. See Callouts 1 and 2 in Figure 2-1.

Note You can align any four of the holes in the front rack-mount bracket to four of the six screw holes in the chassis. The holes that you use depend on the requirements of your rack.

Figure 2-1 Attaching Rack-Mount Brackets to the Cisco Nexus 5596 Switch



1	Front rack-mount bracket	**4**	Rear rack-mount guides
2	Four M4 screws used to attach each bracket to the chassis	**5**	Alternative screw holes for the rack-mount guide screws
3	Alternative screw holes for the front rack-mount bracket screws		

b. Repeat Step 1a with the other front rack-mount bracket on the other side of the switch.

Step 2 Install the rear rack-mount guides on the chassis as follows:

a. Position a rear rack-mount bracket on the side of the chassis with its four holes aligned to four of the six screw holes on the side of the chassis, and then use four M4 screws to attach the bracket to the chassis. See Callout 4 in Figure 2-1.

b. Repeat Step 2a with the other rear rack-mount bracket on the other side of the switch.

Step 3 Install the slider rails to the rack as follows:

a. Position the slider rails at the desired level on the back side of the rack and use two 12-24 screws or two 10-32 screws, depending on the rack thread type, to attach the rails to the rack. See Figure 2-2.

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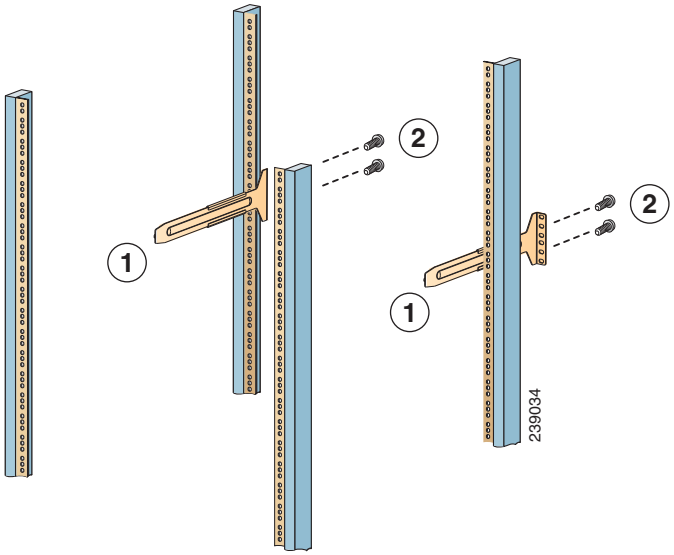
Note For racks with square holes, you might need to position a 12-24 cage nut behind each mounting hole in a slider rail before using a 12-24 screw.

b. Repeat with the other slider rail on the other side of the rack.

c. Use the tape measure and level to verify that the rails are at the same height and horizontal.

Figure 2-2 Installing the Slider Rails



1	Slider rail with screw holes aligned to screw holes in rack	2	Two customer supplied 12-24 or 10-32 screws used to attach each slider rail to the rack

Step 4 Insert the switch into the rack and attach it as follows:

a. Holding the switch with both hands, position the back of the switch between the front posts of the rack.

b. Align the two rear rack-mount guides on either side of the switch with the slider rails installed in the rack. Slide the rack-mount guides onto the slider rails, and then gently slide the switch all the way into the rack. See Figure 2-3.

Note If the switch does not slide easily, try realigning the rack-mount guides on the slider rails.

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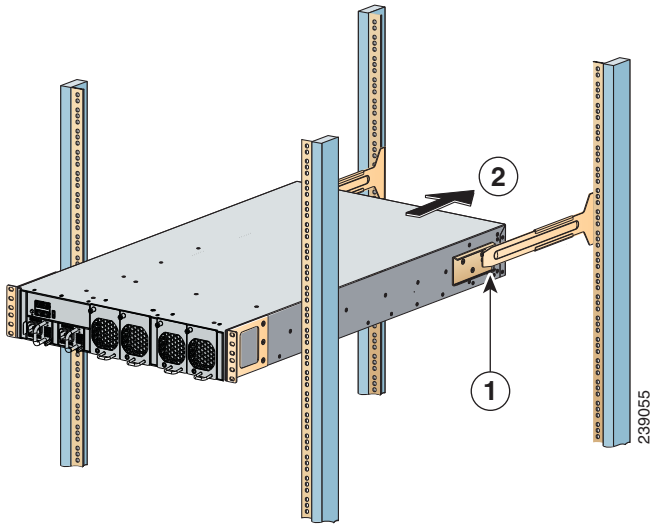
Figure 2-3 Sliding the Chassis Into the Rack

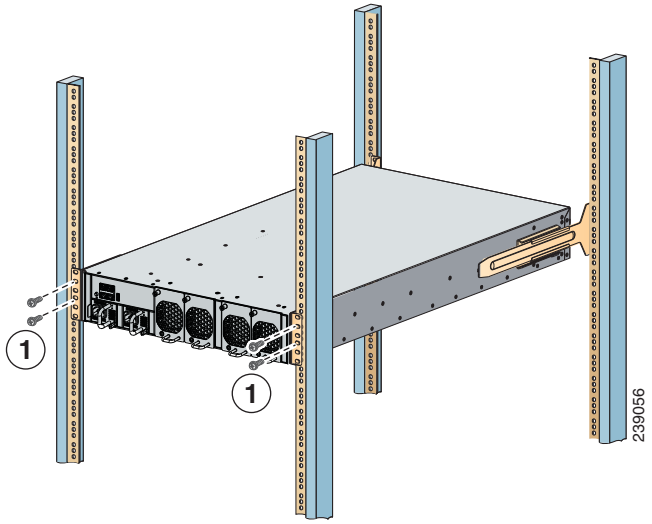


1	Align the two rear rack-mount guides with the slider rails installed in the rack.	**2**	Slide the rack-mount guides onto the slider rails until the front rack-mount brackets come in contact with the front rack-mountin rails

c. Holding the chassis level, insert two screws (12-24 or 10-32, depending on the rack type) through the cage nuts and the holes in one of the front rack-mount brackets and into the threaded holes in the rack-mounting rail. See Figure 2-4.

d. Repeat for the other front rack-mount bracket on the other side of the switch.

Figure 2-4 Attaching the Switch to the Rack



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1	Fasten the chassis to the front of the rack with two 12-24 or 10-32 screws on each side.		

Installing the Cisco Nexus 5548 Switch

This section describes how to use the rack-mount kit provided with the switch to install the Cisco Nexus 5548 switch into a cabinet or rack that meets the requirements described in Appendix A, "Cabinet and Rack Installation."

Note The Cisco Nexus 5548 can be orderd wih front to back airflow but the Cisco Nexus 558UP can be alternatively ordered with back to front airflow. Make sure its air intakes are positioned in a cold isle.

Caution If the rack is on wheels, ensure that the brakes are engaged or that the rack is otherwise stabilized.

Table 2-2 lists the items contained in the rack-mount kit provided with the switch.

Table 2-2 Cisco Nexus 5548 Switch Rack-Mount Kit

Quantity	Part Description
2	Rack-mount brackets
12	M4x0.7 x 8-mm Phillips countersunk screws
2	Rack-mount guides
2	Slider rails (20 inch minimum to a 36 inch maximum

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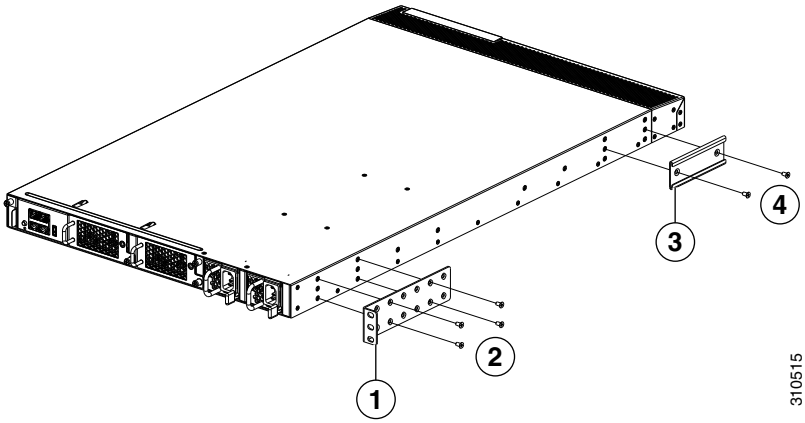
To install the switch in a cabinet or rack using the rack-mount kit provided with the switch, follow these steps:

Step 1 Install the front rack-mount brackets as follows:

a. Position a front rack-mount bracket against the chassis and align the screw holes as shown in Figure 2-5. Attach the front rack-mount bracket to the chassis with six of the M4 screws.

b. Repeat with the other front rack-mount bracket on the other side of the switch.

Figure 2-5 Attaching the Front Rack-Mount Bracket to the Cisco Nexus 5548 Switch



1	Front rack-mount bracket	**3**	Rack-mount guide
2	Four M4 screws used to attach the front rack-mount bracket to the chassis	**4**	Two M4 screws used to attach the rack-mount guide to the chassis

Step 2 Install the rack-mount guides on the switch as follows:

a. Position one of the rack-mount brackets against the side of the switch and align the screw holes. See Figure 2-5. Attach the bracket to the switch with two of the flat-head M4 screws.

b. Repeat with the other rack-mount bracket on the other side of the switch.

Step 3 Attach the slider rails to the rack as shown in Figure 2-6. Use two 12-24 screws or two 10-32 screws, depending on the rack rail thread type. For racks with square holes, insert the 12-24 cage nuts in position behind the mounting holes in the slider rails.

a. Repeat with the other slider rail on the other side of the rack.

b. Use the tape measure and level to verify that the rails are horizontal and at the same height.

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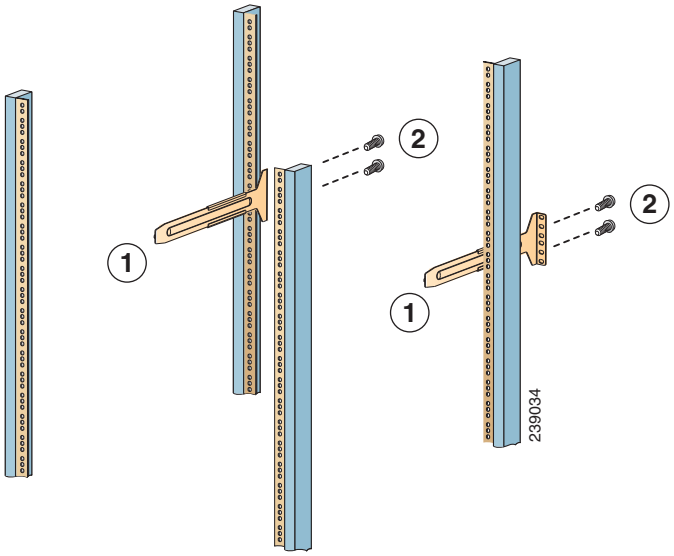
Figure 2-6 Installing the Slider Rails



1	Slider rail with screw holes aligned to screw holes in rack	**2**	Two customer supplied 12-24 or 10-32 screws used to attach each slider rail to the rack

Step 4 Insert the switch into the rack and attach it as follows:

a. Using both hands, position the switch with the back of the switch between the front posts of the rack.

b. Align the two rack-mount guides on either side of the switch with the slider rails installed in the rack. Slide the rack-mount guides onto the slider rails, and then gently slide the switch all the way into the rack. If the switch does not slide easily, try realigning the rack-mount guides on the slider rails.

Step 5 Stabilize the switch in the rack by attaching the front rack-mount brackets to the front rack-mounting rails:

a. Insert two screws (12-24 or 10-32, depending on the rack type) through the cage nuts and the holes in one of the front rack-mount brackets and into the threaded holes in the rack-mounting rail.

b. Repeat for the front rack-mount bracket on the other side of the switch.

Installing the Cisco Nexus 5020 Switch

This section describes how to use the rack-mount kit provided with the switch to install the Cisco Nexus 5020 switch into a cabinet or rack that meets the requirements described in Appendix A, “Cabinet and Rack Installation.”

Note The Cisco Nexus 5020 can be ordered with front to back airflow. Make sure its air intakes are positioned in a cold isle.

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Caution If the rack is on wheels, ensure that the brakes are engaged or that the rack is otherwise stabilized.

Table 2-3 lists the items contained in the rack-mount kit provided with the switch.

Table 2-3 Cisco Nexus 5020 Switch Rack-Mount Kit

Quantity	Part Description
2	Rack-mount brackets
16	M4x0.7 x 8-mm Phillips countersunk screws
2	Rack-mount guides
2	Slider rails (22 inch minimum to a 36 inch maximum)

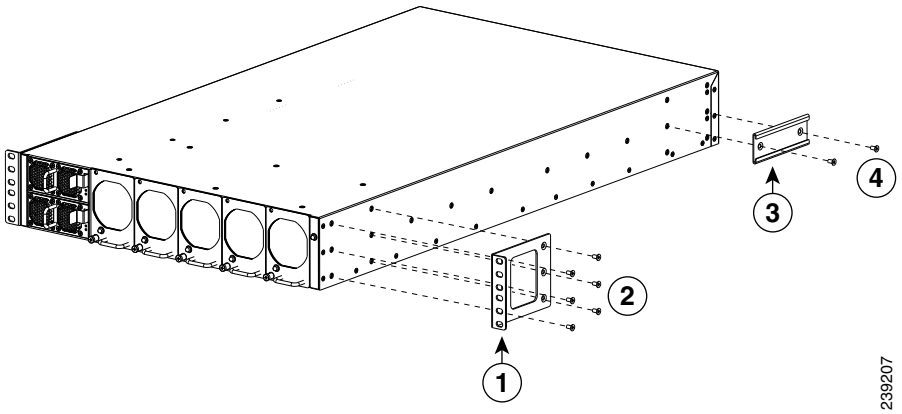
To install the switch in a cabinet or rack using the rack-mount kit provided with the switch, follow these steps:

Step 1 Install the front rack-mount brackets as follows:

a. Position a front rack-mount bracket against the chassis and align the screw holes as shown in Figure 2-7. Attach the front rack-mount bracket to the chassis with six of the M4 screws.

b. Repeat with the other front rack-mount bracket on the other side of the switch.

Figure 2-7 Attaching Front Rack-Mount Bracket to the Cisco Nexus 5020 Switch



1	Front rack-mount bracket	3	Rack-mount guides
2	Attach bracket with six M4 screws	4	Attach guide with two M4 screws

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Step 2 Install the rack-mount guides on the switch as follows:

a. Position one of the rack-mount brackets against the side of the switch and align the screw holes as shown in Figure 2-7. Then attach the bracket to the switch with two of the flat-head M4 screws.

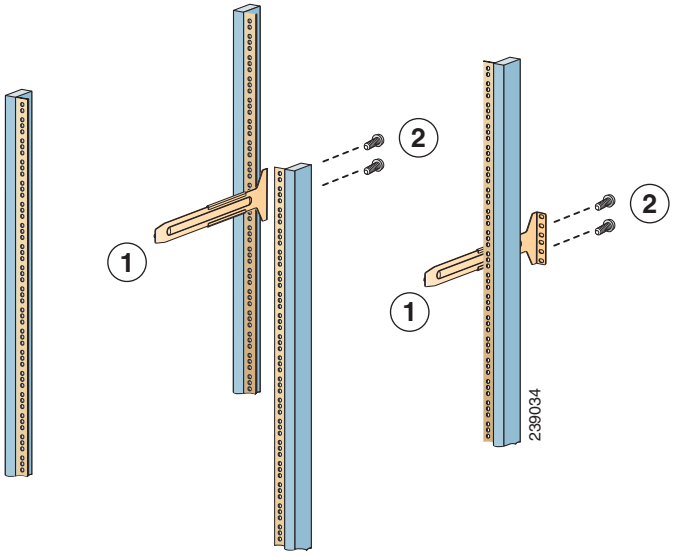
b. Repeat with the other rack-mount bracket on the other side of the switch.

Step 3 Attach the slider rails to the rack as shown in Figure 2-8. Use two 12-24 screws or two 10-32 screws, depending on the rack rail thread type. For racks with square holes, insert the 12-24 cage nuts in position behind the mounting holes in the slider rails.

a. Repeat with the other slider rail on the other side of the rack.

b. Use the tape measure and level to verify that the rails are horizontal and at the same height.

Figure 2-8 Installing the Slider Rails



1	Slider rail with screw holes aligned to screw holes in rack	**2**	Two customer supplied 12-24 or 10-32 screws used to attach each slider rail to the rack

Step 4 Insert the switch into the rack and attach it as follows:

a. Using both hands, position the switch with the back of the switch between the front posts of the rack.

b. Align the two rack-mount guides on either side of the switch with the slider rails installed in the rack. Slide the rack-mount guides onto the slider rails, and then gently slide the switch all the way into the rack. See Figure 2-9. If the switch does not slide easily, try realigning the rack-mount guides on the slider rails.

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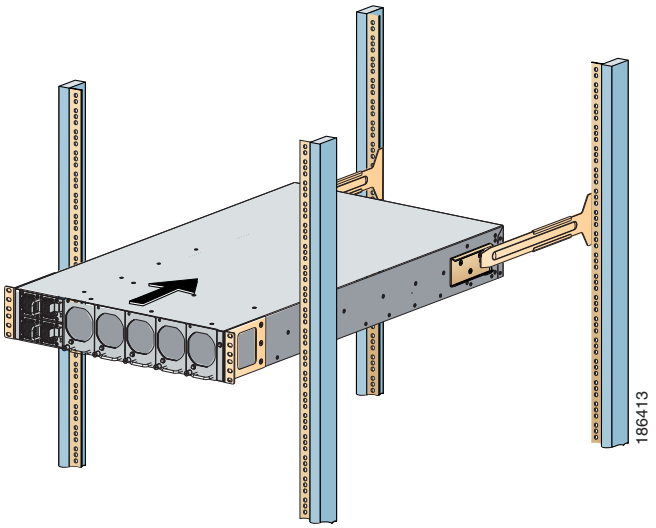
Figure 2-9 Sliding the Chassis Into the Rack

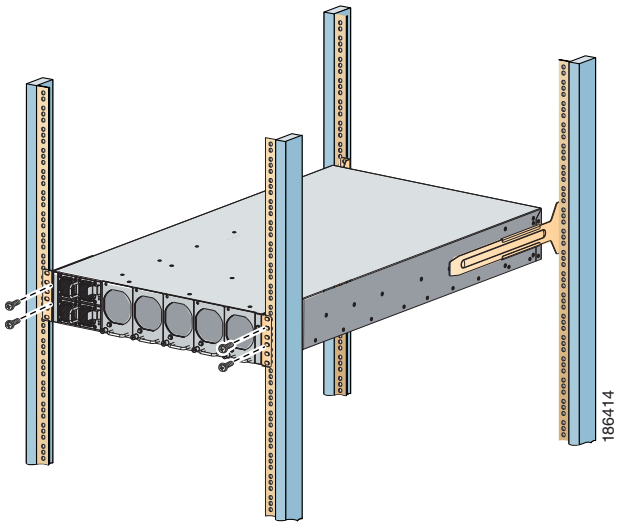


Step 5 Stabilize the switch in the rack by attaching the front rack-mount brackets to the front rack-mounting rails:

a. Insert two screws (12-24 or 10-32, depending on the rack type) through the cage nuts and the holes in one of the front rack-mount brackets and into the threaded holes in the rack-mounting rail. See Figure 2-10.

b. Repeat for the front rack-mount bracket on the other side of the switch.

Figure 2-10 Attaching the Switch to the Rack



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Installing the Cisco Nexus 5010 Switch

This section describes how to use the rack-mount kit provided with the switch to install the Cisco Nexus 5010 switch into a cabinet or rack that meets the requirements described in Appendix A, "Cabinet and Rack Installation."

Note The Cisco Nexus 5010 can be ordered with front to back airflow. Make sure its air intakes are positioned in a cold isle.

Caution If the rack is on wheels, ensure that the brakes are engaged or that the rack is otherwise stabilized.

Table 2-3 lists the items contained in the rack-mount kit provided with the switch.

Table 2-4 Cisco Nexus 5010 Switch Rack-Mount Kit

Quantity	Part Description
2	Rack-mount brackets
12	M4x0.7 x 8-mm Phillips countersunk screws
2	Rack-mount guides
2	Slider rails (21 inch minimum to a 33 inch maximum

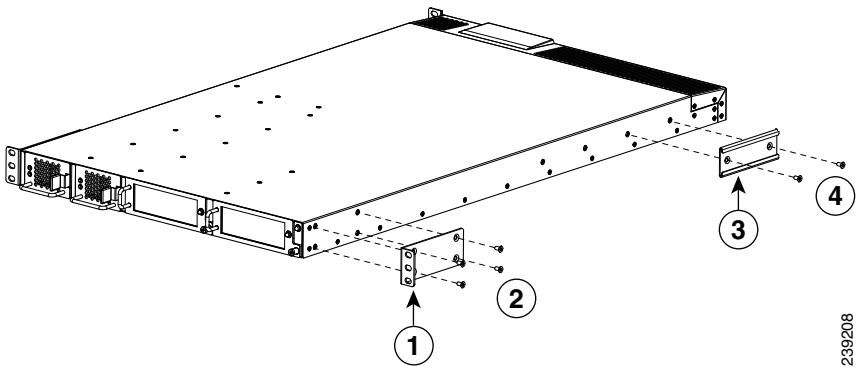
To install the switch in a cabinet or rack using the rack-mount kit provided with the switch, follow these steps:

Step 1 Install the front rack-mount brackets as follows:

a. Position a front rack-mount bracket against the chassis and align the screw holes as shown in Figure 2-11. Then attach the front rack-mount bracket to the chassis with six of the M4 screws.

b. Repeat with the other front rack-mount bracket on the other side of the switch.

Figure 2-11 Attaching a Front Rack-Mount Bracket to the Cisco Nexus 5010 Switch



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1	Front rack-mount bracket	**3**	Rack-mount guides
2	Attach bracket with four M4 screws	**4**	Attach guide with two M4 screws

Step 2 Install the rack-mount guides on the switch as follows:

a. Position one of the rack-mount brackets against the side of the switch and align the screw holes as shown in Figure 2-11. Attach the bracket to the switch with two of the flat-head M4 screws.

b. Repeat with the other rack-mount bracket on the other side of the switch.

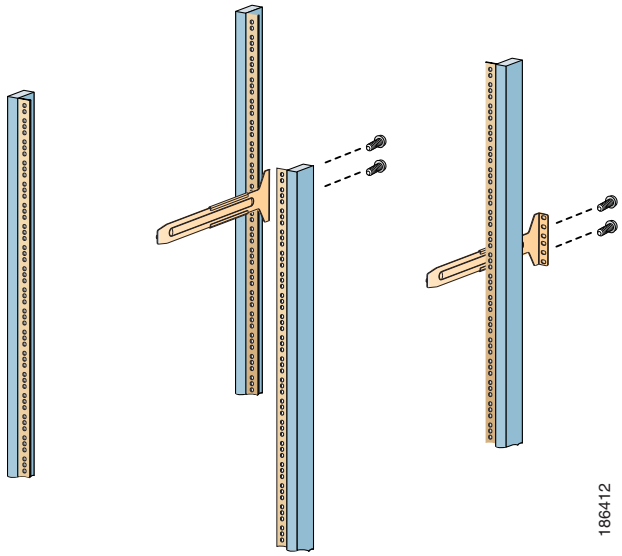
Step 3 Attach the slider rails to the rack (see Figure 2-12). Use two 12-24 screws or two 10-32 screws, depending on the rack rail thread type. For racks with square holes, insert the 12-24 cage nuts in position behind the mounting holes in the slider rails.

Note You must supply the 12-24 or 10-32 screws.

a. Repeat with the other slider rail on the other side of the rack.

b. Use the tape measure and level to verify that the rails are horizontal and at the same height.

Figure 2-12 Installing the Slider Rails



Step 4 Insert the switch into the rack and attach as follows:

a. Using both hands, position the switch with the back of the switch between the front posts of the rack.

b. Align the two rack-mount guides on either side of the switch with the slider rails installed in the rack. Slide the rack-mount glides onto the slider rails, and then gently slide the switch all the way into the rack. As shown in Figure 2-9 on page 2-14, this step is the same as with the step for attaching the Cisco Nexus 5020 to the rack. If the switch does not slide easily, try realigning the rack-mount glides on the slider rails.

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Step 5 Stabilize the switch in the rack by attaching the front rack-mount brackets to the front rack-mounting rails:

a. Insert two screws (12-24 or 10-32, depending on rack type) through the cage nuts and the holes in one of the front rack-mount brackets and into the threaded holes in the rack-mounting rail. This procedure is the same as that for the Cisco Nexus 5020 switch (Figure 2-10 on page 2-14).

b. Repeat for the front rack-mount bracket on the other side of the switch.

Grounding the Switch

This section describes the need for system grounding for all of the Cisco Nexus 5000 Series switches and explains how to prevent damage from electrostatic discharge.

This section includes the following topics:

- Proper Grounding Practices, page 2-17
- Preventing Electrostatic Discharge Damage, page 2-19
- Establishing the System Ground, page 2-21
- Required Tools and Equipment, page 2-21
- Grounding the Cisco Nexus 5500 Series Chassis, page 2-22
- Grounding the Cisco Nexus 5000 Series Chassis, page 2-24

Proper Grounding Practices

Grounding is one of the most important parts of equipment installation. Proper grounding practices ensure that the buildings and the installed equipment within them have low-impedance connections and low-voltage differentials between chassis. When you properly ground systems during installation, you reduce or prevent shock hazards, equipment damage due to transients, and data corruption. Table 2-5 lists some general grounding practice guidelines.

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Table 2-5 Proper Grounding Guidelines

Environment	Electromagnetic Noise Severity Level	Grounding Recommendations
Commercial building is subjected to direct lightning strikes. For example, some places in the United States, such as Florida, are subject to more lightning strikes than other areas.	High	All lightning protection devices must be installed in strict accordance with manufacturer recommendations. Conductors carrying lightning current should be spaced away from power and data lines in accordance with applicable recommendations and codes. Best grounding recommendations must be closely followed.
Commercial building is located in an area where lightning storms frequently occur but is not subject to direct lightning strikes.	High	Best grounding recommendations must be closely followed.
Commercial building contains a mix of information technology equipment and industrial equipment, such as welding.	Medium to high	Best grounding recommendations must be closely followed.
Existing commercial building is not subject to natural environmental noise or man-made industrial noise. This building contains a standard office environment. This installation has a history of malfunction due to electromagnetic noise.	Medium	Determine source and cause of noise if possible, and mitigate as closely as possible at the noise source or reduce coupling from the noise source to the affected equipment. Best grounding recommendations must be closely followed.
New commercial building is not subject to natural environmental noise or man-made industrial noise. This building contains a standard office environment.	Low	Electromagnetic noise problems are not anticipated, but installing a grounding system in a new building is often the least expensive route and the best way to plan for the future. Best grounding recommendations should be followed as closely as possible.
Existing commercial building is not subject to natural environmental noise or man-made industrial noise. This building contains a standard office environment.	Low	Electromagnetic noise problems are not anticipated, but installing a grounding system is always recommended. Best grounding recommendations should be followed as much as possible.

Note In all situations, grounding practices must comply with local National Electric Code (NEC) requirements or local laws and regulations.

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Note Always ensure that all of the modules are completely installed and that the captive installation screws are fully tightened. In addition, ensure that all I/O cables and power cords are properly seated. These practices are normal installation practices and must be followed in all installations.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) damage, which can occur when modules or other FRUs are improperly handled, results in intermittent or complete failures. Modules consist of printed circuit boards that are fixed in metal carriers. Electromagnetic interference (EMI) shielding and connectors are integral components of the carrier. Although the metal carrier helps to protect the board from ESD, always use an ESD grounding strap when handling modules.

For preventing ESD damage, follow these guidelines:

- Always use an ESD wrist strap and ensure that it makes maximum contact with bare skin.
- ESD grounding straps are available with banana plugs, metal spring clips, or alligator clips. All chassis from the Cisco Nexus 5500 Platform or from the Cisco Nexus 5000 Platform switches are equipped with a banana plug connector (identified by the ground symbol next to the connector) somewhere on the front panel. We recommend that you use a personal ESD grounding strap equipped with a banana plug.
- If you choose to use the disposable ESD wrist strap supplied with most FRUs or an ESD wrist strap equipped with an alligator clip, you must attach the system ground lug to the chassis in order to provide a proper grounding point for the ESD wrist strap.

Note This system ground is also referred to as the network equipment building system (NEBS) ground.

- If your chassis does not have the system ground attached, you must install the system ground lug. See the "Establishing the System Ground" section on page 2-21 for installation instructions and location of the chassis system ground pads.

Note You do not need to attach a supplemental system ground wire to the system ground lug; the lug provides a direct path to the bare metal of the chassis.

After you install the system ground lug, follow these steps to correctly attach the ESD wrist strap:

Step 1 Attach the ESD wrist strap to bare skin as follows:

a. If you are using the ESD wrist strap supplied with the FRUs, open the wrist strap package and unwrap the ESD wrist strap. Place the black conductive loop over your wrist and tighten the strap so that it makes good contact with your bare skin.

b. If you are using an ESD wrist strap equipped with an alligator clip, open the package and remove the ESD wrist strap. Locate the end of the wrist strap that attaches to your body and secure it to your bare skin.

Step 2 Grasp the spring or alligator clip on the ESD wrist strap and momentarily touch the clip to a bare metal spot (unpainted surface) on the rack. We recommend that you touch the clip to an unpainted rack rail so that any built-up static charge is then safely dissipated to the entire rack.

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Step 3 Attach either the spring clip or the alligator clip to the ground lug screw as follows:

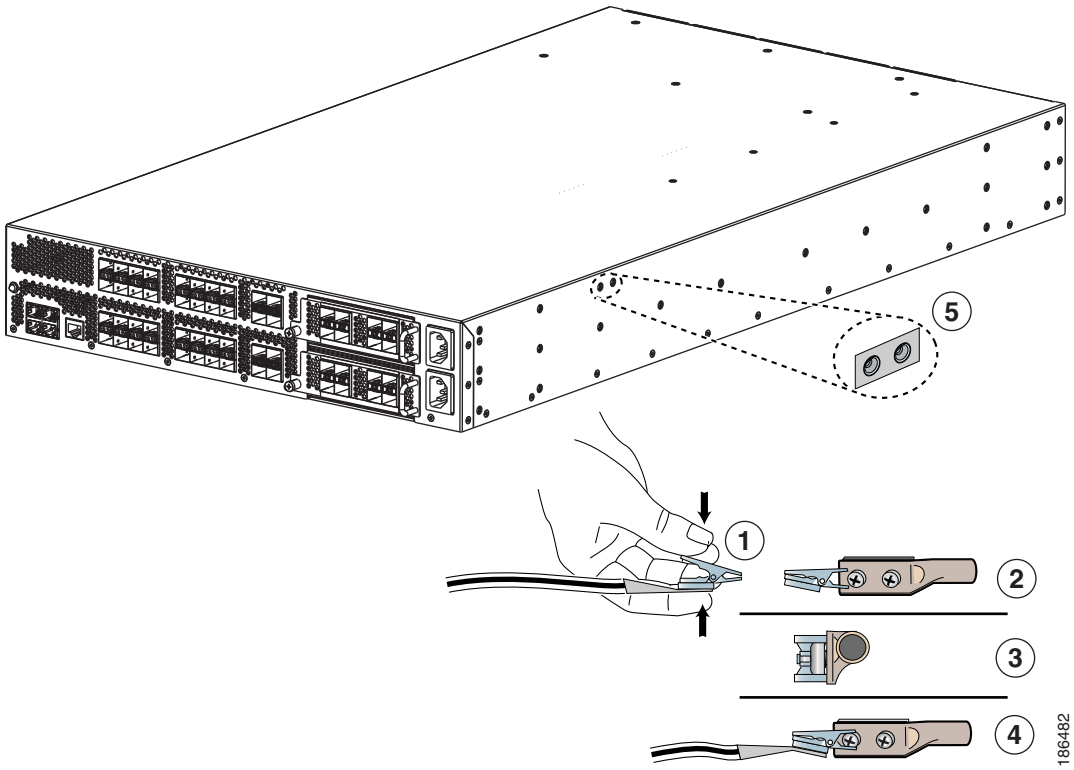
a. If you are using the ESD wrist strap that is supplied with the FRUs, squeeze the spring clip jaws open, position the spring clip to one side of the system ground lug screw head, and slide the spring clip over the lug screw head so that the spring clip jaws close behind the lug screw head.

Note The spring clip jaws do not open wide enough to fit directly over the head of the lug screw or the lug barrel.

b. If you are using an ESD wrist strap that is equipped with an alligator clip, attach the alligator clip directly over the head of the system ground lug screw or to the system ground lug barrel.

To attach the ESD wrist strap to the system ground lug screw for any of the Cisco Nexus 5500 Series switches, clip the grounding wire to the screw that attaches the grounding lug to the switch chassis (see Figure 2-13).

Figure 2-13 Attaching the ESD Wrist Strap to the System Ground Lug Screw



1	ESD ground strap	**4**	Clip installed (behind screw)
2	Clip attached to grounding lug	**5**	System ground connector
3	Side view of grounding lug (clip slid behind screw)		

In addition, follow these guidelines when handling modules:

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- Handle carriers by available handles or edges only; avoid touching the printed circuit boards or connectors.
- Place a removed component board-side-up on an antistatic surface or in a static-shielding container. If you plan to return the component to the factory, immediately place it in a static-shielding container.
- Never attempt to remove the printed circuit board from the metal carrier.

Caution For safety, periodically check the resistance value of the antistatic strap. The measurement should be between 1 and 10 megohm (Mohm).

Establishing the System Ground

This section describes how to connect a system ground to the Cisco Nexus 5500 Series switch or the Cisco Nexus 5000 Series switch.

You must use the system ground on AC-powered systems if you are installing this equipment in a U.S. or European Central Office.

The system ground provides additional grounding for EMI shielding requirements and grounding for the low-voltage supplies (DC-DC converters) on the modules and is intended to satisfy the Telcordia Technologies requirements for supplemental bonding and grounding connections. You must observe the following system grounding guidelines for your chassis:

- You must install the system ground connection with any other rack or system power ground connections that you make. The system ground connection is required if this equipment is installed in a U.S. or European Central Office.
- You must connect both the system ground connection and the power supply ground connection to an earth ground. The system ground connection is required if this equipment is installed in a U.S. or European Central Office.
- You do not need to power down the chassis because the Cisco Nexus 5000 Series switches are equipped with AC-input power supplies.

Required Tools and Equipment

To connect the system ground, you need the following tools and materials:

- Grounding lug—A two-hole standard barrel lug. This lug supports up to 6 AWG wire. Supplied as part of accessory kit.
- Grounding screws—Two M4 x 8mm (metric) pan-head screws. These screws are supplied as part of the accessory kit.
- Grounding wire—Not supplied as part of accessory kit. The grounding wire should be sized according to local and national installation requirements. Depending on the power supply and system, a 12 AWG to 6 AWG copper conductor is required for U.S. installations. Commercially available 6 AWG wire is recommended. The length of the grounding wire depends on the proximity of the switch to proper grounding facilities.
- No. 1 Phillips screwdriver.

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- Crimping tool to crimp the grounding wire to the grounding lug.
- Wire-stripping tool to remove the insulation from the grounding wire.

Grounding the Cisco Nexus 5500 Series Chassis

The chassis has a grounding pad with two threaded M4 holes for attaching a grounding lug. The location of the system ground on the Cisco Nexus 5500 Platform switches is identical to that on the Cisco Nexus 5000 Platform switches.

Note For the procedure on how to ground the Cisco Nexus 5000 Series switch chassis, see the "Grounding the Cisco Nexus 5500 Series Chassis" section on page 2-22.

Warning **When installing or replacing the unit, the ground connection must always be made first and disconnected last.** Statement 1046

Caution We recommend grounding the chassis, even if the rack is already grounded.

Caution All power supplies must be grounded. The receptacles of the AC power cables used to provide power to the chassis must be the grounding type, and the grounding conductors should connect to protective earth ground at the service equipment.

Warning **When installing or replacing the unit, the ground connection must always be made first and disconnected last.**
Statement 1046

Caution Grounding the chassis is required if you are using DC power supplies, even if the rack is already grounded. A grounding pad with two threaded M4 holes is provided on the chassis for attaching a grounding lug. The ground lug must be NRTL listed. In addition, the copper conductor (wires) must be used and the copper conductor must comply with NEC code for ampacity.

To attach the grounding lug and cable to the chassis, follow these steps:

Step 1 Use a wire-stripping tool to remove approximately 0.75 inches (19 mm) of the covering from the end of the grounding cable.

Step 2 Insert the stripped end of the grounding cable into the open end of the grounding lug.

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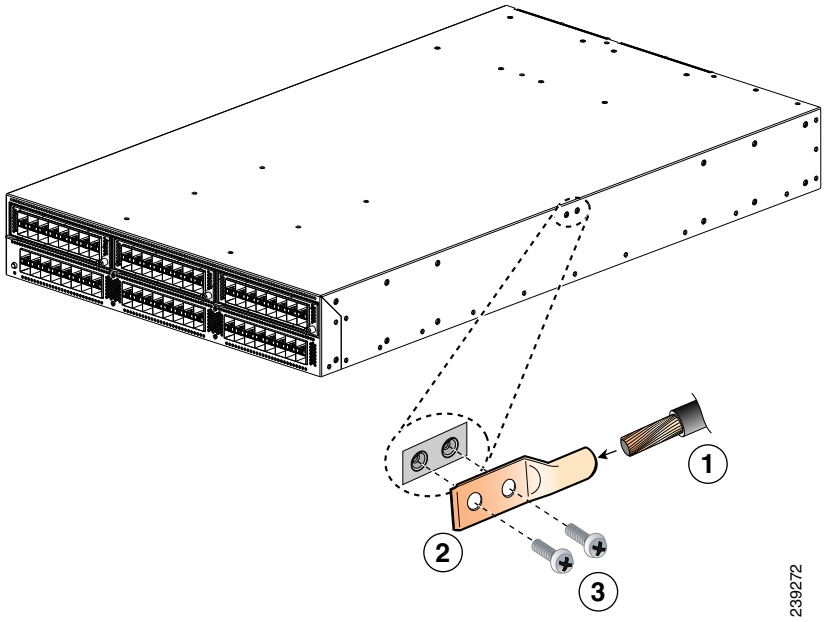
Figure 2-14 Grounding a Cisco Nexus 5500 Platform Switch (Cisco Nexus 5596 Shown)



1	Insert stripped end of grounding cable in grounding lug.	**3**	Fasten the lug to the chassis with two M4 screws.
2	Align grounding lug screw holes to the grounding holes in the chassis.		

Step 3 Use the crimping tool to secure the grounding cable in the grounding lug.

Step 4 Remove the adhesive label from the grounding pad on the chassis.

Step 5 Place the grounding lug against the grounding pad so that there is solid metal-to-metal contact, and insert the two M4 screws with washers through the holes in the grounding lug and into the grounding pad.

Step 6 Ensure that the lug and cable do not interfere with other equipment.

Step 7 Prepare the other end of the grounding cable and connect it to an appropriate grounding point in your site to ensure adequate earth ground.

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Grounding the Cisco Nexus 5000 Series Chassis

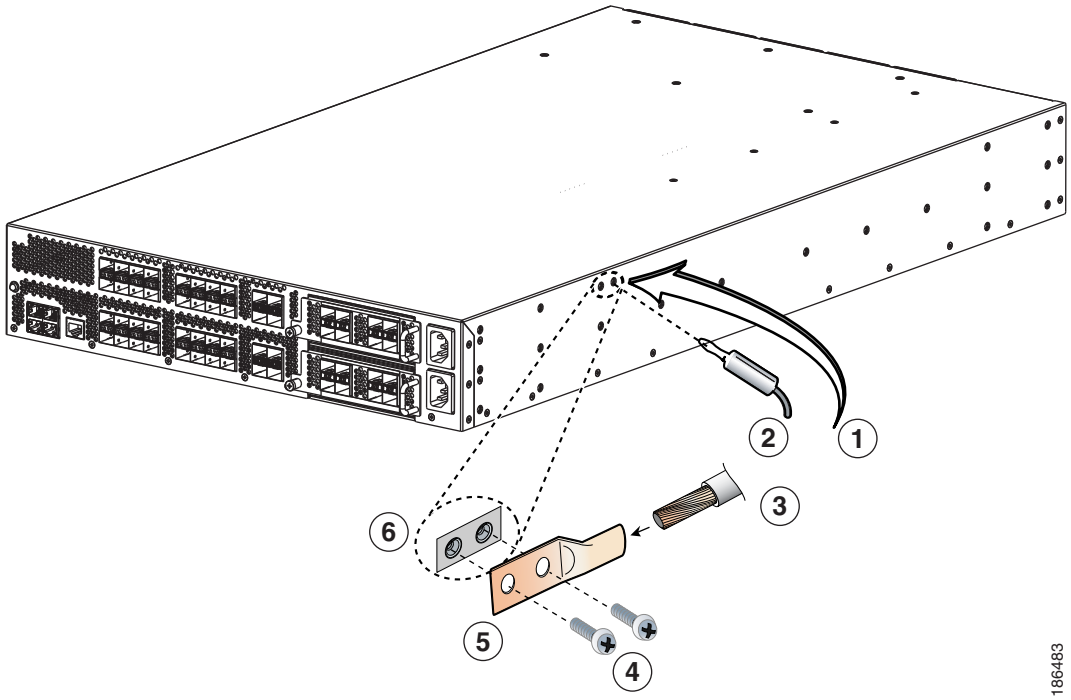
The chassis has a grounding pad with two threaded M4 holes for attaching a grounding lug. Figure 2-15 shows the system ground location on the Cisco Nexus 5020 switch. It is identical for the Cisco Nexus 5010 switch.

Warning **When installing or replacing the unit, the ground connection must always be made first and disconnected last.** Statement 1046

Caution We recommend grounding the chassis, even if the rack is already grounded.

Caution All power supplies must be grounded. The receptacles of the AC power cables used to provide power to the chassis must be the grounding type, and the grounding conductors should connect to protective earth ground at the service equipment.

Figure 2-15 Grounding a Cisco Nexus 5000 Series Switch (Cisco Nexus 5020 Switch Shown)



1	ESD socket (on switch)	4	Screws, M4, with square cone washers
2	ESD plug	5	NRTL listed grounding lug
3	Grounding cable	6	Close-up of grounding pad on switch

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Warning **When installing or replacing the unit, the ground connection must always be made first and disconnected last.**
Statement 1046

Caution Grounding the chassis is required if you are using DC power supplies, even if the rack is already grounded. A grounding pad with two threaded M4 holes is provided on the chassis for attaching a grounding lug. The ground lug must be NRTL listed. In addition, the copper conductor (wires) must be used and the copper conductor must comply with NEC code for ampacity.

To attach the grounding lug and cable to the chassis, follow these steps:

Step 1 Use a wire-stripping tool to remove approximately 0.75 inches (19 mm) of the covering from the end of the grounding cable.

Step 2 Insert the stripped end of the grounding cable into the open end of the grounding lug.

Step 3 Use the crimping tool to secure the grounding cable in the grounding lug.

Step 4 Remove the adhesive label from the grounding pad on the chassis.

Step 5 Place the grounding lug against the grounding pad so that there is solid metal-to-metal contact, and insert the two M4 screws with washers through the holes in the grounding lug and into the grounding pad.

Step 6 Ensure that the lug and cable do not interfere with other equipment.

Step 7 Prepare the other end of the grounding cable and connect it to an appropriate grounding point in your site to ensure adequate earth ground.

Starting the Switch

This section provides instructions for powering up the Cisco Nexus 5500 Series switch or the Cisco Nexus 5000 Series switch and verifying the component installation.

Note Do not connect the Ethernet port to the LAN until the initial switch configuration has been performed. For instructions on configuring the switch, see the *Cisco Nexus 5000 Series CLI Configuration Guide*. For instructions on connecting to the console port, see the "Connecting to the Console Port" section on page 3-2.

Warning **When installing or replacing the unit, the ground connection must always be made first and disconnected last.**
Statement 1046

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To power up the switch and verify hardware operation, follow these steps:

Step 1 Verify that empty power supply slots have filler panels installed, the faceplates of all modules are flush with the front of the chassis, and the captive screws of the power supplies, fan module, and all expansion modules are tight.

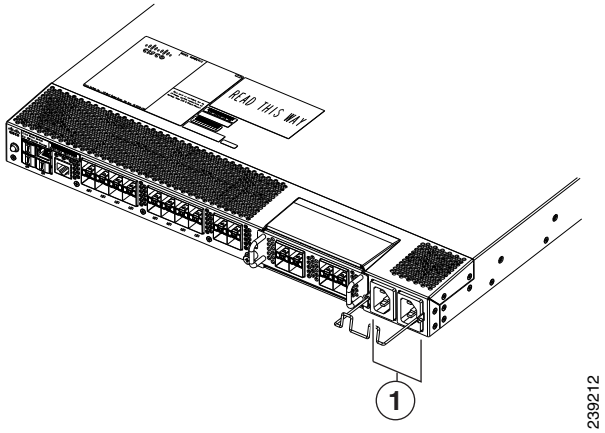
Step 2 Verify that the power supply and the fan modules are installed.

Note Depending on the outlet receptacle on your power distribution unit, you may need the optional jumper power cord to connect the switch to your outlet receptacle. See the "Jumper Power Cord" section on page C-9.

Step 3 Ensure that the switch is adequately grounded as described in the "Grounding the Switch" section on page 2-17, and that the power cables are connected to outlets that have the required AC power voltages (see the "Power Specifications" section on page B-3).

Step 4 For the Cisco Nexus 5020 switch and the Cisco Nexus 5010 switch, insert each end of the power clip (from the accessory kit) into holes on tabs located on either side of the power connectors (see Figure 2-16).

Figure 2-16 Attaching the Power Cord Clip to the Cisco Nexus 5010 Switch



1	Insert both clip ends into the tabs located on either side of the power receptacles.		

Step 5 Connect each power cable to the power connectors on the chassis and an AC power source. Press the power cable into the power clip to endure that the power cable stays connected to the chassis when bumped. The switch should power on as soon as you connect the power cable.

Step 6 Listen for the fans; they should begin operating when the power cable is plugged in.

Send documentation comments to nexus5kdocs@cisco.com.

Step 7 After the switch boots, verify that the LED operation is as follows:

- Fan module—Status LED is green.
- Power supply—Status LED is green.
- After initialization, the system status LED is green, indicating that all chassis environmental monitors are reporting that the system is operational. If this LED is orange or red, then one or more environmental monitor is reporting a problem.
- The Link LEDs for the Ethernet connector should not be on unless the cable is connected.

Note The link LEDs for the Fibre Channel ports remain yellow until the ports are enabled, and the LED for the Ethernet connector port remains off until the port is connected.

Step 8 Try removing and reinstalling a component that is not operating correctly. If it still does not operate correctly, contact your customer service representative for a replacement.

Note If you purchased this product through a Cisco reseller, contact the reseller directly for technical support. If you purchased this product directly from Cisco, contact Cisco Technical Support at this URL: http://www.cisco.com/en/US/support/tsd_cisco_worldwide_contacts.html.

Step 9 Verify that the system software has booted and the switch has initialized without error messages.

If any problems occur, see Appendix E, "Troubleshooting Hardware Components." If you cannot resolve an issue, contact your customer service representative.

Step 10 Complete the worksheets provided in Appendix G, "Site Planning and Maintenance Records" for future reference.

Note A setup utility automatically launches the first time you access the switch and guides you through the basic configuration. For instructions on how to configure the switch and check module connectivity, see the appropriate Cisco Nexus 5000 Series CLI configuration guide or the *Cisco Nexus 5000 Series Fabric Manager Configuration Guide*.

Send documentation comments to nexus5kdocs@cisco.com.

CHAPTER 3

Connecting the Switch

This chapter describes how to connect the Cisco Nexus 5500 Platform and Cisco Nexus 5000 Platform switches to the following types of ports:

- Console port —An RS-232 port that you can use to create a local management connection.
- Ethernet ports, both encrypted and unencrypted—These ports can be used to connect to a LAN.
- Fibre Channel ports—These ports can be used to connect to a SAN.

Caution When running power and data cables in overhead or subfloor cable trays, we strongly recommend that you locate power cables and other potential noise sources as far away as practical from network cabling that terminates on Cisco equipment. In situations where long parallel cable runs cannot be separated by at least 3.3 ft (1 m), we recommend that you shield any potential noise sources by housing them in a grounded metallic conduit.

This chapter includes the following sections:

- Preparing for Network Connections, page 3-2
- Connecting to the Console Port, page 3-2
- Connecting to the Ethernet Connector Port, page 3-3
- Connecting to an Ethernet Port, page 3-4
- Connecting to a Fibre Channel Port, page 3-7
- Maintaining SFP Transceivers and Fiber-Optic Cables, page 3-11

Send documentation comments to nexus5kdocs@cisco.com.

Preparing for Network Connections

When preparing your site for network connections to the Cisco Nexus 5500 Platform switch or Cisco Nexus 5000 Platform switch, consider the following for each type of interface, and gather all the required equipment before connecting the ports:

- Cabling required for each interface type
- Distance limitations for each signal type
- Additional interface equipment required

Connecting to the Console Port

Note This section applies to the Cisco Nexus 5500 Platform switches and the Cisco Nexus 5000 Platform switches.

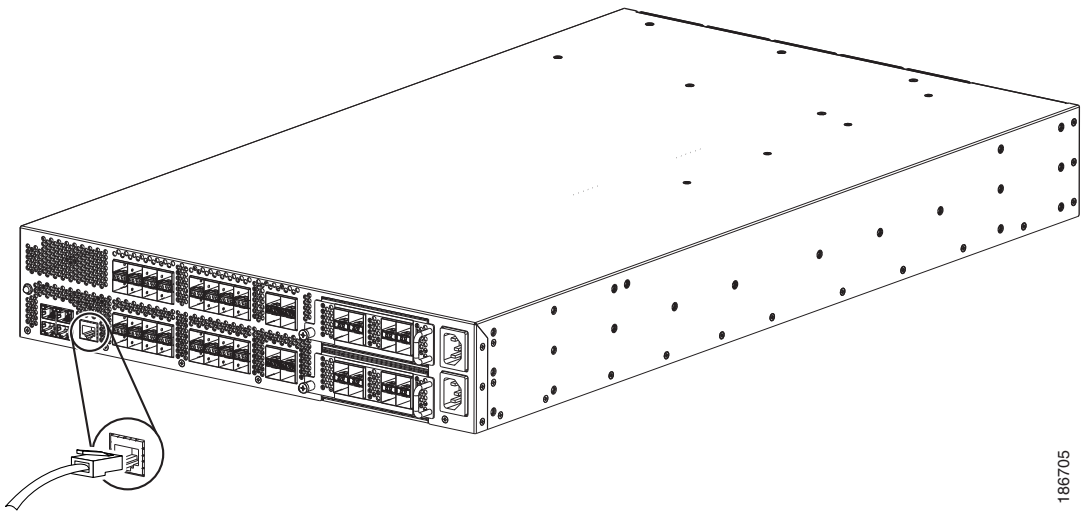
The console port is an RS-232 port with an RJ-45 interface. (See Figure 3-1.) The console port is an asynchronous (async) serial port; any device connected to this port must be capable of asynchronous transmission.

We recommend using this port to create a local management connection to set the IP address and other initial configuration settings before connecting the switch to the network for the first time.

Caution The console port can be used to connect to a modem. If you do not connect it to a modem, connect it either before powering the switch on or after the switch has completed the boot process.

Figure 3-1 shows how to connect to the console port on the Cisco Nexus 5000 Platform switch. The process is identical for the Cisco Nexus 5500 Platform switch.

Figure 3-1 Connecting to the Console Port on a Cisco Nexus 5000 Platform Switch



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You can use the console port to perform the following:

- Configure the Cisco Nexus 5500 Platform switch or Cisco Nexus 5000 Platform switch from the CLI.
- Monitor network statistics and errors.
- Configure SNMP agent parameters.
- Download software updates.

Note To connect the console port to a computer terminal, the computer must support VT100 terminal emulation. The terminal emulation software (such as HyperTerminal or Procomm Plus) makes communication between the Cisco Nexus 5500 Platform switch or Cisco Nexus 5000 Platform switch and a computer possible during setup and configuration.

To connect the console port to a computer terminal, follow these steps:

Step 1 Configure the terminal emulator program to match the following default port characteristics: 9600 baud, 8 data bits, 1 stop bit, no parity.

Step 2 Connect the RJ-45 connector of the console cable to the console port (see Figure 3-1) and the DB-9 connector to the computer serial port.

Note For configuration instructions, see the appropriate Cisco Nexus 5000 Series CLI configuration guide.

Connecting to the Ethernet Connector Port

Note This section applies to the Cisco Nexus 5500 Platform switches and the Cisco Nexus 5000 Platform switches.

Caution To prevent an IP address conflict, do not connect the management port to the network until the initial configuration is complete. For configuration instructions, see the Cisco Nexus 5000 Series CLI configuration guide.

This section describes how to connect the Ethernet connector port to an external hub, switch, or router. The Ethernet connector port has an RJ-45 interface. To connect the Ethernet connector port to an external hub, switch, or router, follow these steps:

Step 1 Connect the appropriate modular cable to the Ethernet connector port:

- Use modular, RJ-45, straight-through UTP cables to connect the Ethernet connector port to an Ethernet switch port or hub.
- Use a cross-over cable to connect to a router interface.

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Step 2 Connect the other end of the cable to the device.

Connecting to an Ethernet Port

To connect to an Ethernet port, you must install SFP+ transceivers and connect them with optical cables.

This section includes the following topics:

- Installing and Replacing SFP+ Transceivers, page 3-4
- Installing Cables into SFP+ Transceivers, page 3-6

Installing and Replacing SFP+ Transceivers

Caution Excessively removing and installing an SFP+ transceiver can shorten its life. Unless it is absolutely necessary, do not remove and insert SFP+ transceivers. To prevent damage to the cable and transceiver, we recommend that you disconnect cables before installing or removing SFP transceivers.

This section includes the following topics:

- Installing an SFP+ Transceiver, page 3-4
- Replacing an SFP+ Transceiver, page 3-5

Installing an SFP+ Transceiver

To install an SFP+ transceiver, follow these steps:

Step 1 Attach an ESD-preventive wrist strap and follow its instructions for use.

Step 2 Remove the dust cover from the port cage.

Step 3 Remove the dust cover from the port end of the transceiver.

Step 4 Insert the transceiver into the port as follows:

- If the transceiver has a Mylar tab latch, position the transceiver with the tab on the bottom, and then gently insert the transceiver into the port until it clicks into place.
- If the transceiver has a bale clasp latch, position the transceiver with the clasp on the bottom, close the clasp by pushing it up over the transceiver, and then gently insert the transceiver into the port until it clicks into place.

Caution If the transceiver does not install easily, ensure that it is correctly positioned and the tab or clasp are in the correct position before continuing.

Send documentation comments to nexus5kdocs@cisco.com.

Note If you cannot install the cable into the transceiver, insert or leave the dust plug in the cable end of the transceiver.

Replacing an SFP+ Transceiver

To replace an SFP+ transceiver, follow these steps:

Step 1 Attach an ESD-preventive wrist strap and follow its instructions for use.

Step 2 If a cable is installed in the transceiver, do the following:

a. Record the cable and port connections for later reference.

b. Press the release latch on the cable, grasp the connector near the connection point, and gently pull the connector from the transceiver.

c. Insert a dust plug into the cable end of the transceiver.

Caution If the transceiver does not remove easily in the next step, push the transceiver completely in and then ensure that the latch is in the correct position before continuing.

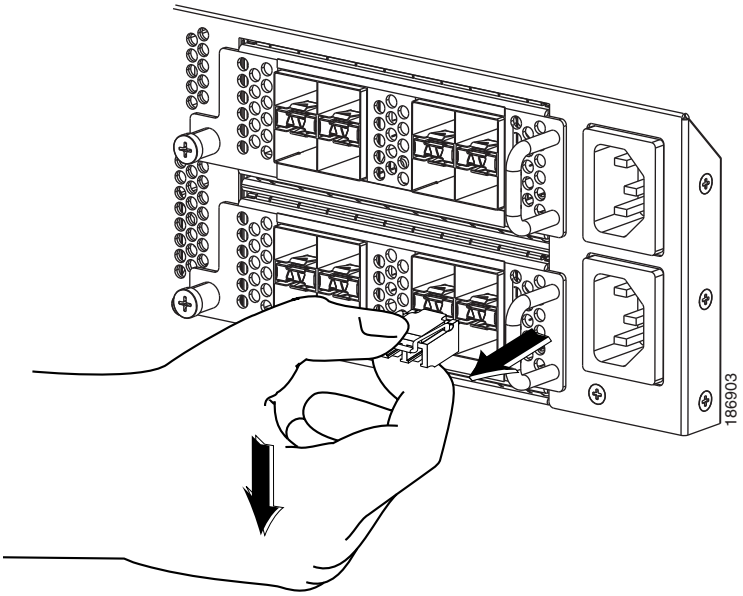
Step 3 Remove the transceiver from the port as follows:

- If the transceiver has a Mylar tab latch, gently pull the tab straight out (do not twist), and then pull the transceiver out of the port.
- If the transceiver has a bale clasp latch, open the clasp by pressing it downward, and then pull the transceiver out of the port.

Note If you have difficulty removing a bale clasp SFP+ transceiver, you should reseat it by returning the bale clasp latch to the up position. Press the SFP+ transceiver inward and upward into the cage. Next, lower the bale clasp latch and pull the SFP+ transceiver straight out with a slight upward lifting force (see Figure 3-2). Be careful not to damage the port cage during this process.

Send documentation comments to nexus5kdocs@cisco.com.

Figure 3-2 Alternate Removal Method for Bale Clasp SFP+ Transceivers



Step 4 Insert a dust cover into the port end of the transceiver and place the transceiver on an antistatic mat or into a static shielding bag if you plan to return it to the factory.

Step 5 Install a replacement transceiver (see the "Installing an SFP+ Transceiver" section on page 3-4). If another transceiver is not being installed, protect the optical cage by inserting a clean cover.

Installing Cables into SFP+ Transceivers

Caution To prevent damage to the copper cables, do not place more tension on them than the rated limit and do not bend to a radius of less than 1 inch (2.54 cm) if there is no tension in the cable, or 2 inches (5.08 cm) if there is tension in the cable.

This section includes the following topics:

- Installing a Cable into an SFP+ Transceiver, page 3-6
- Replacing a Cable for an SFP+ Transceiver, page 3-7

Installing a Cable into an SFP+ Transceiver

Caution To prevent possible damage to the cable or transceiver, install the transceiver in the port before installing the cable in the transceiver.

To install a cable into a transceiver, follow these steps:

Step 1 Attach an ESD-preventive wrist strap and follow its instructions for use.

Send documentation comments to nexus5kdocs@cisco.com.

Step 2 Remove the dust cover from the connector on the cable.

Step 3 Remove the dust cover from the cable end of the transceiver.

Step 4 Align the cable connector with the transceiver and insert the connector into the transceiver until it clicks into place.

Caution If the cable does not install easily, ensure that it is correctly positioned before continuing.

For instructions on verifying connectivity, see the appropriate Cisco Nexus 5000 Series CLI configuration guide.

Replacing a Cable for an SFP+ Transceiver

Caution When pulling a cable from a transceiver, grip the body of the connector. Do not pull on the jacket sleeve, because this action can compromise the fiber-optic termination in the connector.

Caution If the cable does not remove easily, ensure that any latch present on the cable has been released before continuing.

To remove the cable, follow these steps:

Step 1 Attach an ESD-preventive wrist strap and follow its instructions for use.

Step 2 Press the release latch on the cable, grasp the connector near the connection point, and gently pull the connector from the transceiver.

Step 3 Either install a replacement cable in the SFP+ transceiver (see the "Installing a Cable into an SFP+ Transceiver" section on page 3-6) or insert dust plugs into the cable end of the transceiver and the end of the removed cable.

Connecting to a Fibre Channel Port

You can use an SFP transceiver to connect to a Fibre Channel port.

This section includes the following topics:

- Removing and Installing SFP Transceivers, page 3-8
- Removing and Installing Cables into SFP Transceivers, page 3-10
- Maintaining SFP Transceivers and Fiber-Optic Cables, page 3-11

Send documentation comments to nexus5kdocs@cisco.com.

Removing and Installing SFP Transceivers

Caution Excessively removing and installing an SFP transceiver can shorten its life. Do not remove and insert SFP transceivers more often unless it is absolutely necessary. We recommend that you disconnect the cables before installing or removing SFP transceivers to prevent damage to the cable or transceiver.

This section includes the following topics:

- Installing an SFP Transceiver, page 3-8
- Removing an SFP Transceiver, page 3-8

Installing an SFP Transceiver

To install an SFP transceiver, follow these steps:

Step 1 Attach an ESD-preventive wrist strap and follow its instructions for use.

Step 2 Remove the dust cover from the port cage.

Step 3 Remove the dust cover from the port end of the transceiver.

Step 4 Insert the transceiver into the port as follows:

- If the transceiver has a Mylar tab latch, position the transceiver with the tab on the bottom, and then gently insert the transceiver into the port until it clicks into place.
- If the transceiver has a bale clasp latch, position the transceiver with the clasp on the bottom, close the clasp by pushing it up over the transceiver, and then gently insert the transceiver into the port until it clicks into place.

Caution If the transceiver does not install easily, ensure that it is correctly positioned and the tab or clasp are in the correct position before continuing.

Note If you cannot install the cable into the transceiver, insert or leave the dust plug in the cable end of the transceiver.

Removing an SFP Transceiver

To remove an SFP transceiver, follow these steps:

Step 1 Attach an ESD-preventive wrist strap and follow its instructions for use.

Step 2 If a cable is installed in the transceiver, do the following:

a. Record the cable and port connections for later reference.

b. Press the release latch on the cable, grasp the connector near the connection point, and gently pull the connector from the transceiver.

Send documentation comments to nexus5kdocs@cisco.com.

c. Insert a dust plug into the cable end of the transceiver.

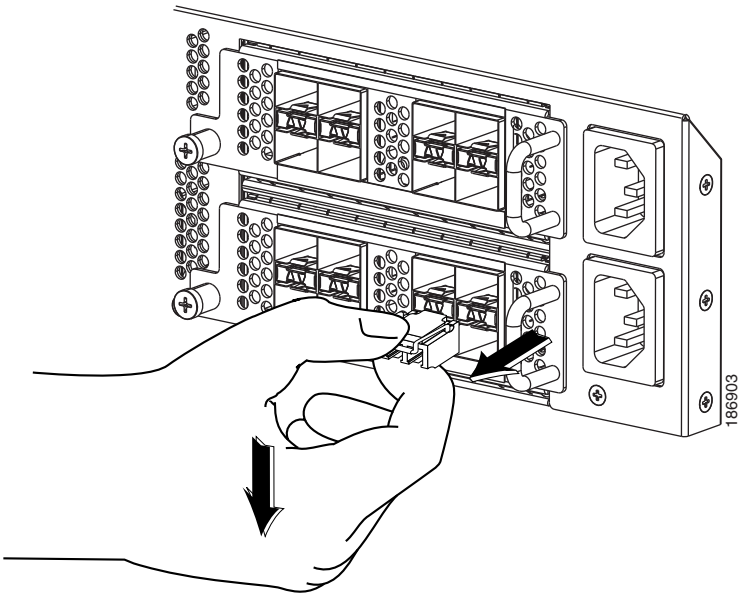
Caution If the transceiver does not remove easily in the next step, push the transceiver completely in and then ensure that the latch is in the correct position before continuing.

Step 3 Remove the transceiver from the port as follows:

- If the transceiver has a Mylar tab latch, gently pull the tab straight out (do not twist), and then pull the transceiver out of the port.
- If the transceiver has a bale clasp latch, open the clasp by pressing it downward, and then pull the transceiver out of the port.

Note If you have difficulty removing a bale clasp SFP transceiver, you should reseat the SFP by returning the bale clasp to the up position. Press the SFP inward and upward into the cage. Next, lower the bale clasp latch and pull the SFP straight out with a slight upward lifting force (see Figure 3-3). Be careful not to damage the port cage during this process.

Figure 3-3 Alternate Removal Method for Bale Clasp SFP Transceivers



Step 4 Insert a dust cover into the port end of the transceiver and place the transceiver on an antistatic mat or into a static-shielding bag if you plan to return it to the factory.

Step 5 If another transceiver is not being installed, protect the optical cage by inserting a clean cover.

Send documentation comments to nexus5kdocs@cisco.com.

Removing and Installing Cables into SFP Transceivers

Caution To prevent damage to the fiber-optic cables, do not place more tension on them than the rated limit and do not bend to a radius of less than 1 inch (2.54 cm) if there is no tension in the cable, or 2 inches (5.08 cm) if there is tension in the cable.

This section includes the following topics:

- Installing a Cable into an SFP Transceiver, page 3-10
- Removing a Cable from an SFP Transceiver, page 3-11

Installing a Cable into an SFP Transceiver

Caution To prevent possible damage to the cable or transceiver, install the transceiver in the port before installing the cable in the transceiver.

To install a cable into a transceiver, follow these steps:

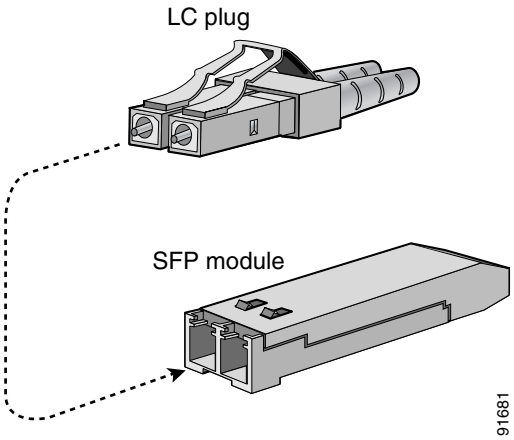
Step 1 Attach an ESD-preventive wrist strap and follow its instructions for use.

Step 2 Remove the dust cover from the connector on the cable.

Step 3 Remove the dust cover from the cable end of the transceiver.

Step 4 Align the cable connector with the transceiver and insert the connector into the transceiver until it clicks into place. (See Figure 3-4).

Figure 3-4 Connecting the LC-Type Cable to a Fibre Channel Port



Caution If the cable does not install easily, ensure that it is correctly positioned before continuing.

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For instructions on verifying connectivity, see the appropriate Cisco Nexus 5000 Series CLI Configuration Guide.

Removing a Cable from an SFP Transceiver

Caution When pulling a cable from a transceiver, grip the body of the connector. Do not pull on the jacket sleeve, because this action can compromise the fiber-optic termination in the connector.

Caution If the cable does not remove easily, ensure that any latch present on the cable has been released before continuing.

To remove the cable, follow these steps:

Step 1 Attach an ESD-preventive wrist strap and follow its instructions for use.

Step 2 Press the release latch on the cable, grasp the connector near the connection point, and gently pull the connector from the transceiver.

Step 3 Insert a dust plug into the cable end of the transceiver.

Step 4 Insert a dust plug onto the end of the cable.

Maintaining SFP Transceivers and Fiber-Optic Cables

SFP transceivers and fiber-optic cables must be kept clean and dust-free to maintain high signal accuracy and prevent damage to the connectors. Attenuation (loss of light) is increased by contamination and should be below 0.35 dB.

Consider the following maintenance guidelines:

- SFP transceivers are static sensitive. To prevent ESD damage, wear an ESD-preventive wrist strap that is connected to the chassis.
- Do not remove and insert a transceiver more often than is necessary. Repeated removals and insertions can shorten its useful life.
- Keep all optical connections covered when not in use. If they become dusty, clean before using to prevent dust from scratching the fiber-optic cable ends.
- Do not touch ends of connectors to prevent fingerprints and other contamination.
- Clean regularly; the required frequency of cleaning depends upon the environment. In addition, clean connectors if they are exposed to dust or accidentally touched. Both wet and dry cleaning techniques can be effective; refer to your site's fiber-optic connection cleaning procedure.
- Inspect routinely for dust and damage. If damage is suspected, clean and then inspect fiber ends under a microscope to determine if damage has occurred.

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CHAPTER 4

Replacing Components

This chapter describes how to remove and install components for the Cisco Nexus 5500 Platform switch or the Cisco Nexus 5000 Platform switch.

This section includes the following sections:

- Replacing an I/O Module for a Cisco Nexus 5548 Switch, page 4-1
- Replacing Expansion Modules, page 4-5
- Replacing or Installing Power Supplies, page 4-8
- Replacing a Fan Module, page 4-13
- Removing the Cisco Nexus 5500 Platform Chassis or the Cisco Nexus 5000 Platform Chassis, page 4-17

Caution To prevent ESD damage, wear grounding wrist straps during these procedures and handle modules by the carrier edges only.

Replacing an I/O Module for a Cisco Nexus 5548 Switch

To replace an I/O module with another I/O module (Layer 2 I/O module or layer 3 I/O module) you must remove the right fan module and then pull the I/O module out using the handle of the left fan module, which is installed in the middle of the I/O module. You then install the replacement I/O module and fill its fan module slots with the fan modules from the original I/O module.

Note If the module includes the product ID on the front, it is a Layer 3 I/O module (product ID N55-D160L3 or N55-D160L3-V2). The N55-D160L3-V2 uses a newer version of the Layer 3 ASIC and enables higher table sizes in a future software release from 8K host entries to 16K host entries or from 4K multicast routes to 8K multicast routes (IPv4). The Layer 2 module (product ID N55-DL2) does not include the product ID on the front.

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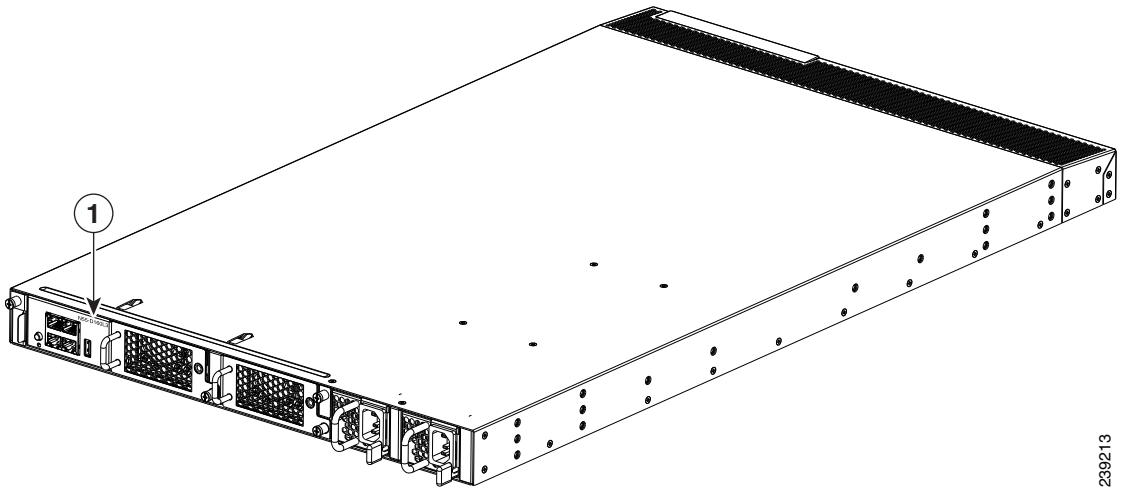
Figure 4-1 Product ID on a Layer 3 I/O Module



1	Layer 3 modules have an N55-D160L3 or N55-D160L3-V2 product ID. Layer 2 modules do not list a PID.		

This section includes the following topics:

- Removing an I/O Module, page 4-2
- Installing an I/O Module, page 4-4

Removing an I/O Module

To remove an I/O module from a Cisco Nexus 5548 chassis, follow these steps:

Step 1 Prepare an antistatic surface for placing removed components.

Step 2 On the right fan module, loosen its captive screw so that it is no longer connected to the chassis or I/O module (see Callout 1 in Figure 4-2).

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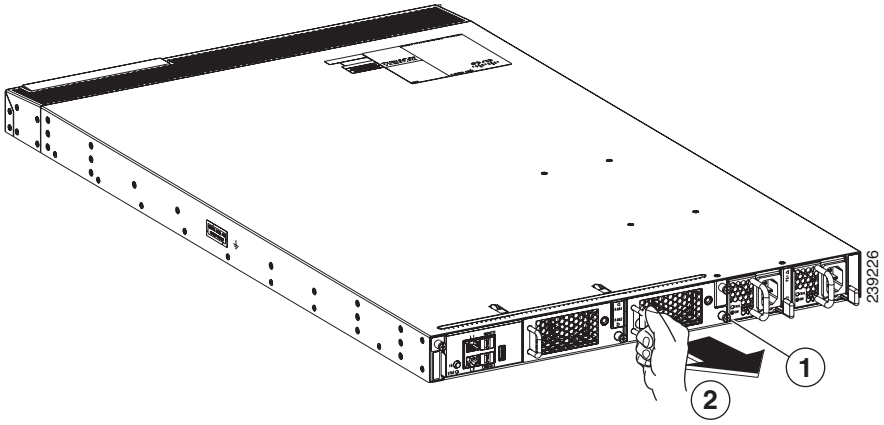
Figure 4-2 Removing a Fan Tray from the I/O Module in the Chassis

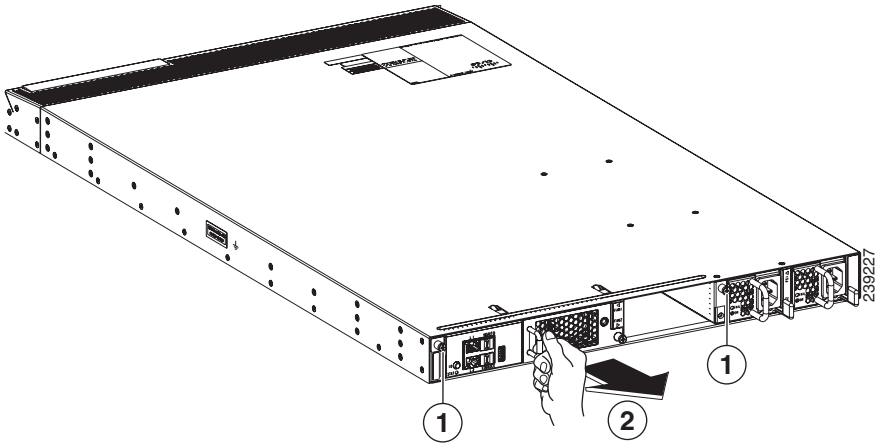


1	Loosen the captive screw on the right most fan tray so that the screw is free of the I/O module.	**2**	Pull the fan tray out of the I/O module and set on an antistatic surface.

Step 3 With a hand on the fan module handle, pull the fan module out of the chassis (see Callout 2 in Figure 4-2) and place it on an antistatic surface.

Step 4 Loosen the two captive screws on the I/O module so that they are no longer in contact with the chassis (see Callout 1 in Figure 4-3).

Figure 4-3 Detaching the I/O Module from the Chassis



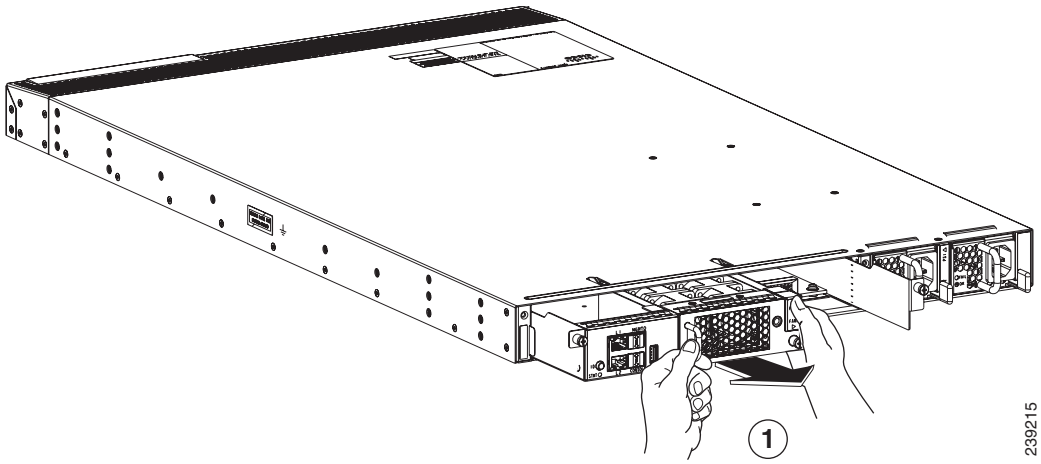
1	Loosen captive screws until they are no longer attached to the chassis.	**2**	Pull the I/O module part way out of the chassis.

Step 5 Holding the handle for the left fan module, pull the I/O module (which houses the fan module) part way out of the chassis (see callout 2 in Figure 4-3).

Step 6 Place your other hand under the I/O module to support its weight, and fully remove the module from the chassis (see Callout 1 in Figure 4-4).

Send documentation comments to nexus5kdocs@cisco.com.

Figure 4-4 Removing the I/O Module from the Chassis



1	Pull the handle on the left fan module to completely remove the I/O module from the chassis.		

Step 7 Place the removed I/O module on the antistatic surface.

Step 8 On the remaining fan tray in the I/O module, loosen its captive screw so that it is no longer attached to the I/O module.

Step 9 Pull the fan tray out of the I/O module.

You are ready to install a replacement I/O module as explained in the "Installing a Fan Module" section on page 4-14.

Installing an I/O Module

To install an I/O module in a Cisco Nexus 5548 chassis, follow these steps:

Step 1 Align the replacement I/O module to the I/O module slot in the chassis and push the module all the way into the slot so that its two captive screws are aligned to their holes in the chassis.

Step 2 Tighten both captive screws to the chassis.

Step 3 Install both fan modules into the replacement I/O module (see the "Installing a Fan Module" section on page 4-14).

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Replacing Expansion Modules

Caution To prevent ESD damage, wear grounding wrist straps during these procedures and handle expansion modules by the carrier edges only.

Install the switch in the rack before installing expansion modules. For information about installing the chassis, see the "Installing the Switch" section on page 2-5.

Note Cisco NX-OS Release 5.0(2)N1(1) does not support the hot swapping of a Cisco Nexus 5548 expansion module during switch operations. Instead, you must power down the switch before removing and replacing an expansion module. If you are using NX-OS Release 5.0(2)N2(1) or later release, you can hot swap the expansion modules.

This section includes the following topics:

- Removing an Expansion Module from a Cisco Nexus 5500 Platform Chassis, page 4-5
- Installing an Expansion Module in a Cisco Nexus 5500 Platform Chassis, page 4-5
- Removing an Expansion Module from a Cisco Nexus 5000 Platform Chassis, page 4-6
- Installing an Expansion Module in the Cisco Nexus 5000 Platform Chassis, page 4-7

Removing an Expansion Module from a Cisco Nexus 5500 Platform Chassis

To remove an expansion module from the Cisco Nexus 5500 Platform switch chassis, follow these steps:

Step 1 Disconnect any network interface cables attached to the module.

Step 2 Open the packing materials for the module and prepare an antistatic surface for uninstalled modules.

Step 3 Loosen the captive screw on the ejector lever so that the lever can move.

Step 4 Rotate the ejector lever fully from the front of the module until it stops at about 80 degrees from the front.

Step 5 With one hand on the ejector handle and front of the module, pull the module part way out of its slot in the chassis.

Step 6 Place your other hand under the module to support its weight and fully remove the module.

Step 7 Place the module on an antistatic surface or pack it in its packing materials.

You are ready to install a replacement module in the chassis as described in the "Installing an Expansion Module in a Cisco Nexus 5500 Platform Chassis" section on page 4-5.Figure 4-4

Installing an Expansion Module in a Cisco Nexus 5500 Platform Chassis

To install an expansion module in a Cisco Nexus 5500 Platform switch chassis, follow these steps:

Step 1 Remove the module from its packing materials and place it on an antistatic surface.

Send documentation comments to nexus5kdocs@cisco.com.

Step 2 If the captive screw on the expansion module is not loose, turn it counterclockwise to fully loosen.

Step 3 Rotate the ejector lever away from the front of the module until it stops at about 80 degrees from the front.

Step 4 Holding the module with one hand on the front of the module and the other hand on its carrier edges or bottom, align the module to the open slot.

Step 5 Push the module fully into the slot until the ejector engages and the lever moves.

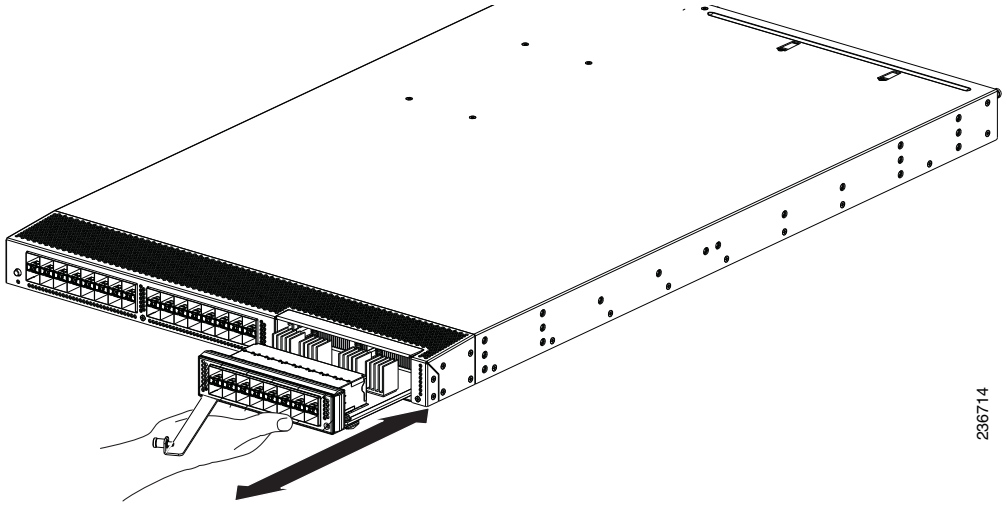
Step 6 Rotate the ejector lever to the front of the module so that the module is fully inserted in the slot and the captive screw on the ejector assembly is in position to screw into the expansion module.

Step 7 Tighten the captive screw to the expansion module.

Step 8 Verify the installation by making sure that the module status LED turns on and is green.

Figure 4-5 shows the positioning of an expansion module in the Cisco Nexus 5548 switch chassis.

Figure 4-5 Positioning the Module in the Cisco Nexus 5548 Chassis



Removing an Expansion Module from a Cisco Nexus 5000 Platform Chassis

To remove an expansion module from a Cisco Nexus 5000 Platform chassis, follow these steps:

Step 1 Loosen the captive screw on the front of the module.

Step 2 Slide the module part way out of its slot and place your other hand under it to support it.

Step 3 Pull the module fully out of the slot and set it on an antistatic surface or repack it in its packing materials.

You are ready to install a replacement module as described in the "Installing an Expansion Module in the Cisco Nexus 5000 Platform Chassis" section on page 4-7.

Send documentation comments to nexus5kdocs@cisco.com.

Installing an Expansion Module in the Cisco Nexus 5000 Platform Chassis

To install an expansion module in the Cisco Nexus 5000 Platform chassis, follow these steps:

Step 1 Grasp the handle of the module and place your other hand under the module to support it.

Step 2 Gently slide the module into the opening until you cannot push it any further.

Step 3 Tighten the captive screw on the front of the module.

Figure 4-6 shows the positioning of an expansion module in the Cisco Nexus 5020 chassis.

Figure 4-6 Positioning the Module in the Cisco Nexus 5020 Chassis

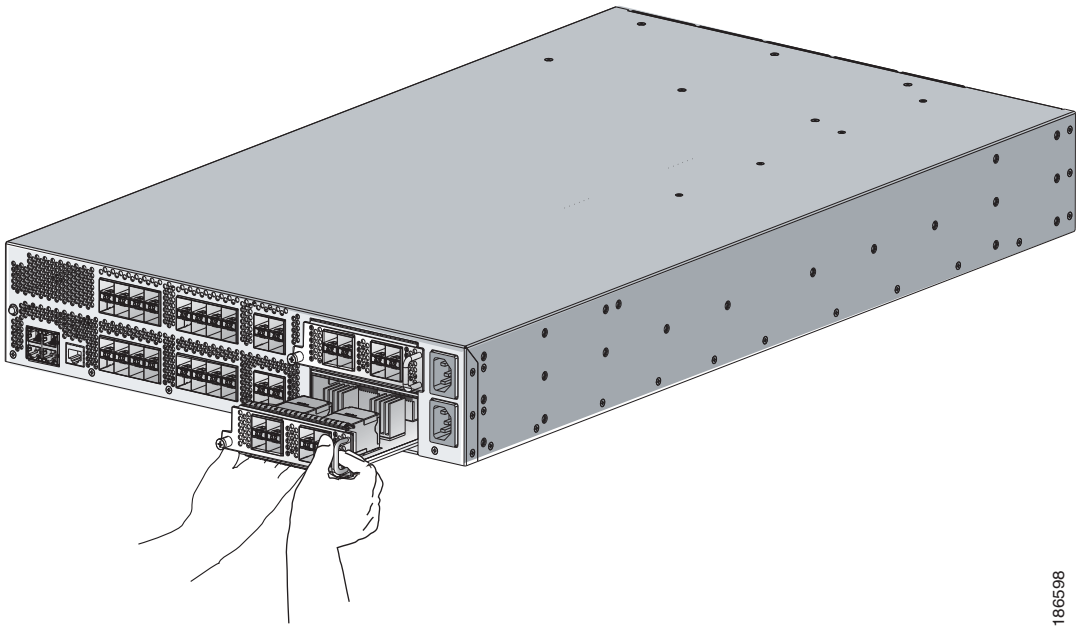


Figure 4-7 shows the positioning of an expansion module in the Cisco Nexus 5010 chassis.

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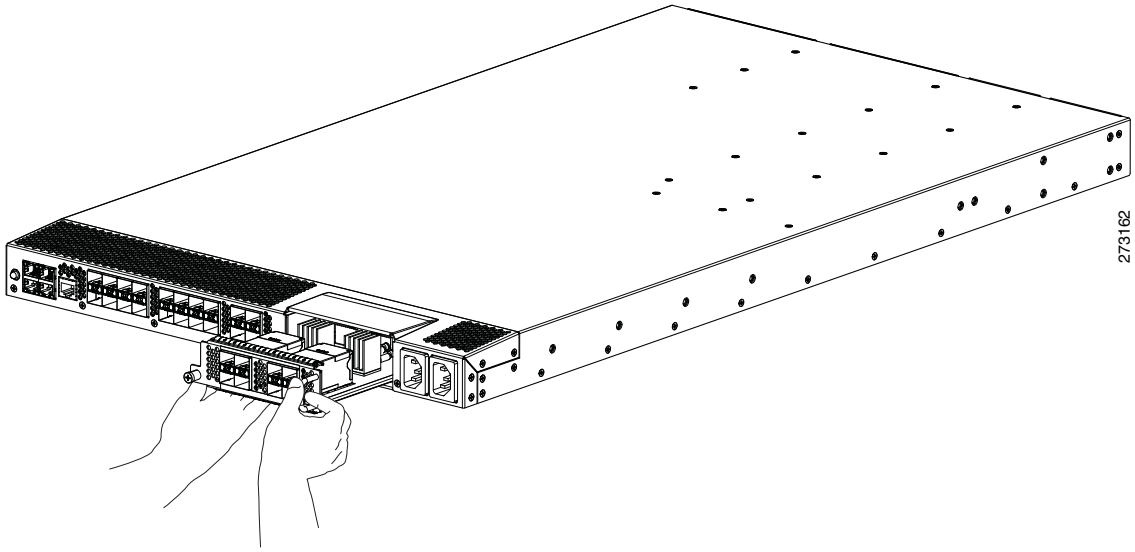
Figure 4-7 Positioning the Module in the Cisco Nexus 5010 Chassis



Replacing or Installing Power Supplies

The Cisco Nexus 5500 Platform switches and the Cisco Nexus 5000 Platform switches support two front-end AC or DC power supplies, but may be used with one power supply. The switches each require one power supply, but you can include a second power supply for power redundancy. If you use only one power supply, you must fill the second power supply slot with a blank module to maintain the designed airflow.

If you need to replace an existing power supply, follow the procedures that explain how to remove and install power supplies. If you are installing a new power supply where one did not exist before, follow the installation procedure.

Note The airflow direction must be the same for all power suply and fan modules in the chassis. You can order all modules with front to back airflow but you can alternatively order back to front airflow for the Cisco Nexus 5548UP switch modules. Back to front airflow modules have a black stripe.Make sure that all modules have either a black strip for back to front or no stripe for front to back.

This section includes the following topics:

- Removing a Power Supply, page 4-9
- Installing a Power Supply, page 4-11
- Wiring a DC Power Connector, page 4-12

Note You can replace a faulty power supply while the system is operating if the other power supply is functioning.

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Removing a Power Supply

Caution If you are using a Cisco Nexus 5500 Platform switch or a Cisco Nexus 5000 Platform switch with one power supply, removing the power supply causes the switch to shut down. If you are using two power supplies and you remove one of them, the switch can continue to operate.

To remove an AC or DC power supply, follow these steps:

Step 1 Ensure that the system (earth) ground connection has been made. For ground connection instructions, see the "Grounding the Switch" section on page 2-17.

Step 2 Remove the AC power cord or DC wiring connector.

Step 3 Grasp the power supply handle with your left hand.

Step 4 Push against the release latch with your left thumb,and slide the power supply part way out of the chassis. To remove a power supply from a Cisco Nexus 5500 Platform chassis, see Figure 4-8 and Figure 4-9. To remove a power supply from the Cisco Nexus 5020 switch, see Figure 4-10. To remove a power supply from the Cisco Nexus 5010 switch, see Figure 4-11.

Figure 4-8 Removing the Power Supply from a Cisco Nexus 5596 Switch

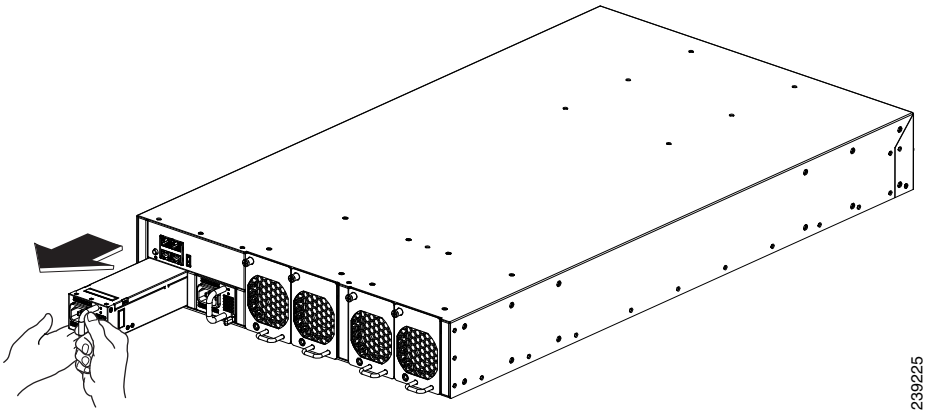

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Figure 4-9 Removing the Power Supply from a Cisco Nexus 5548 Switch

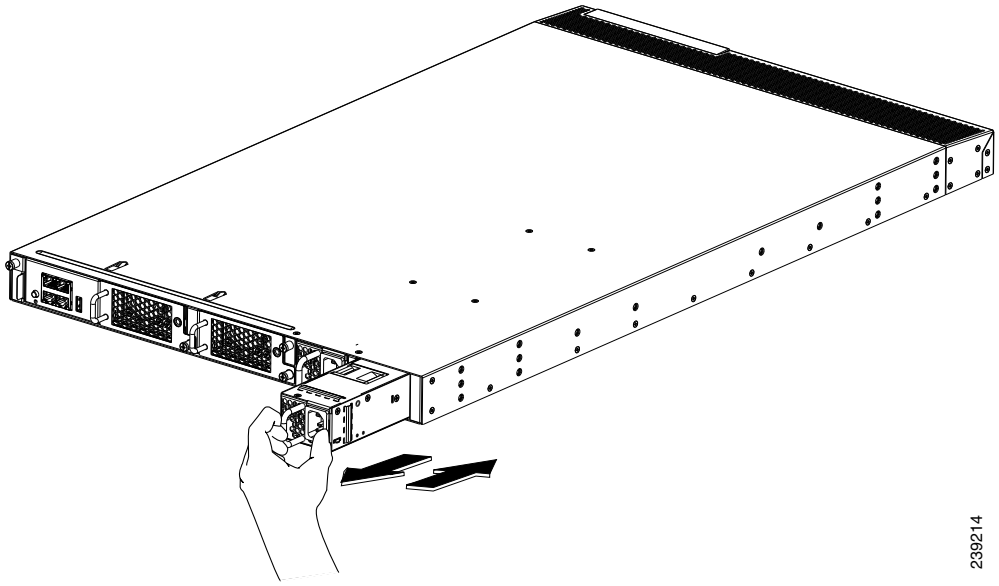
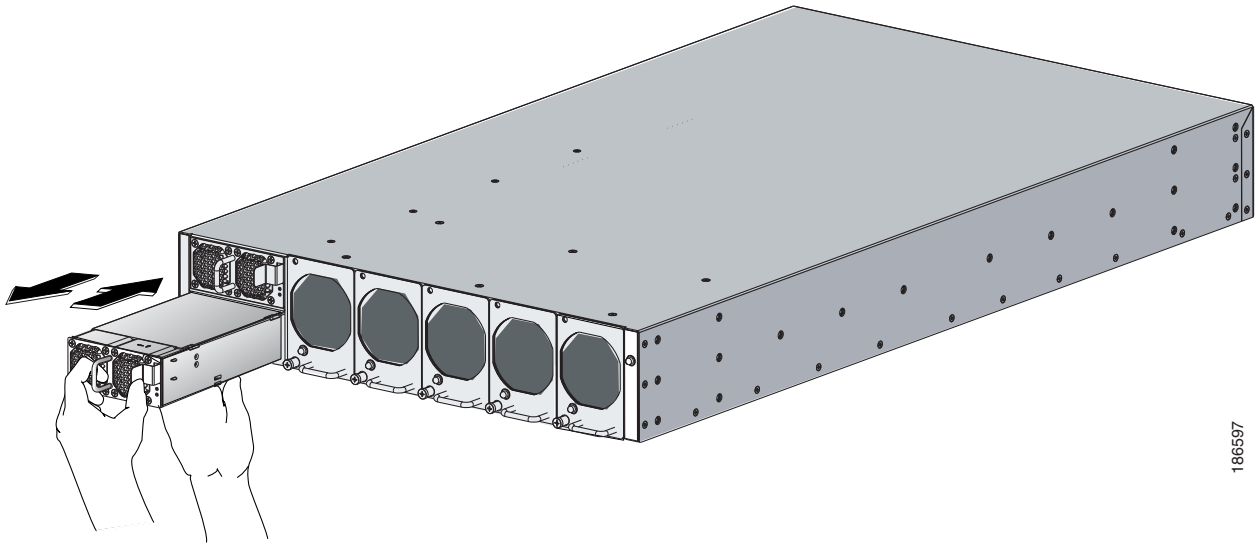
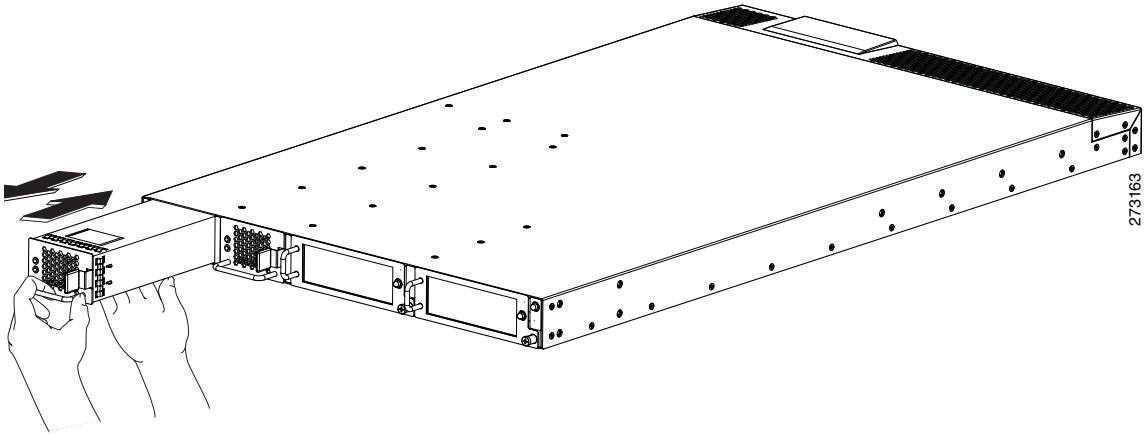


Figure 4-10 Removing the Power Supply from a Cisco Nexus 5020 Switch



Send documentation comments to nexus5kdocs@cisco.com.

Figure 4-11 Removing the Power Supply from a Cisco Nexus 5010 Switch



Step 5 Place your other hand under the power supply to support its weight, and then completely remove the module from the slot.

Step 6 If the power supply bay is to remain empty, install a blank power supply filler panel.If you are replacing the power supply, see Installing a Power Supply, page 4-11

Installing a Power Supply

To install a power supply in a Cisco Nexus 5500 Platform chassis or the Cisco Nexus 5000 Platform chassis, follow these steps:

Step 1 Ensure that the system (earth) ground connection has been made. For ground connection instructions, see the "Grounding the Switch" section on page 2-17.

Step 2 If the power supply bay has a filler panel, press the latches on the sides of the filler panel, and then slide it out of the power supply bay.

Step 3 Hold the power supply by the handle and position it so that the release latch is on the right, and then slide it into the power supply bay, ensuring that the power supply is fully seated in the bay.

Step 4 Plug the AC power cable or DC wiring connector into the inlet receptacle at the rear of the chassis. For a DC installation, you should secure the plug to the power supply by tightening both captive screws on the plug.

Note Depending on the outlet receptacle on your power distribution unit, you may need the optional jumper power cord to connect the Cisco Nexus 5548 switch to your outlet receptacle. See the "Jumper Power Cord" section on page C-9.

Step 5 Connect the other end of the power cable to an AC power source. DC sources should connect negative (black wire) and then positive (red wire) connections.

Caution In a system with dual power supplies, connect each power supply to a separate power source. In case of a power source failure, the second source will most likely still be available.

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Step 6 Verify the power supply operation by checking that the power supply LED is green.

Wiring a DC Power Connector

Warning **A readily accessible two-poled disconnect device must be incorporated in the fixed wiring.** Statement 1022

Warning **This product requires short-circuit (overcurrent) protection, to be provided as part of the building installation. Install only in accordance with national and local wiring regulations.** Statement 1045

Warning **When installing or replacing the unit, the ground connection must always be made first and disconnected last.** Statement 1046

Warning **Installation of the equipment must comply with local and national electrical codes.** Statement 1074

Warning **Hazardous voltage or energy may be present on DC power terminals. Always replace cover when terminals are not in service. Be sure uninsulated conductors are not accessible when cover is in place.** Statement 1075

Before installing a DC power supply to the switch, you will need to attach DC connection wires that you provide (10 GA recommended) to the DC power connector included in the DC power supply's accessory kit. To wire the connector:

Step 1 Using a 1/8" flat head screwdriver or No. 1 Phillips head screwdriver, loosen the set screws on the connector to freely accept the power wires. The connector will accept 8-24 AWG wires, use what your local electrical code calls for.

Step 2 Strip 1/2" of insulation off the DC wires you will use.

Step 3 Insert the black (DC negative) wire into the right aperture on the connector and tighten down the connection set screw. Finger tight or about 3 ft./lbs should be sufficient.

Step 4 Insert the red (DC positive) wire into the left aperture on the connector and tighten down the connection set screw. Do not tighten over 0.7 Nm.

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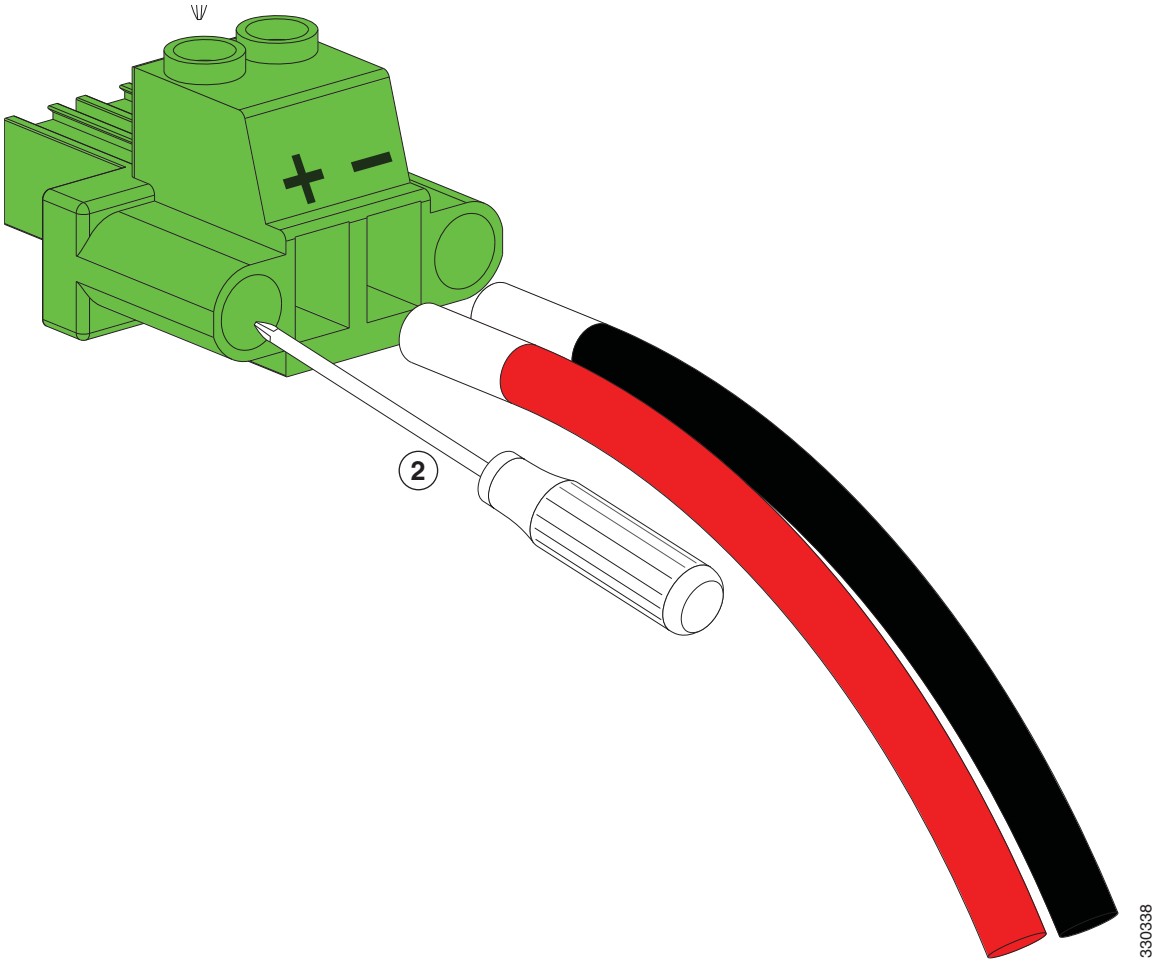
Figure 4-12 Wiring the DC Power Connector



Replacing a Fan Module

The fan module is designed to be removed and replaced while the system is operating without presenting an electrical hazard or damage to the system, if the replacement is performed promptly.

Note The airflow direction must be the same for all power suply and fan modules in the chassis. You can order all modules with front to back airflow but you can alternatively order back to front airflow for the Cisco Nexus 5548 UP switch modules. Back to front airflow modules have a black stripe. Make sure that all modules have either a black strip for back to front or no stripe for front to back.

This section includes the following topics:

- Removing a Fan Module, page 4-14
- Installing a Fan Module, page 4-14

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Removing a Fan Module

Warning **When removing the fan tray, keep your hands and fingers away from the spinning fan blades. Let the fan blades completely stop before you remove the fan tray.** Statement 258

To remove a fan module, follow these steps:

Step 1 Loosen the captive screws on the fan module by turning them counterclockwise, using a flat-blade or number 2 Phillips screwdriver if required.

Step 2 Grasp the handle of fan module and pull it outward.

Step 3 Pull the fan module clear of the chassis.

Installing a Fan Module

To install a fan module, follow these steps:

Step 1 Hold the fan module with the LED at the bottom (Cisco Nexus 5596 or Cisco Nexus 5020) or right (Cisco Nexus 5548 or Cisco Nexus 5010).

Step 2 Place the fan module into the front chassis fan slot so it rests on the chassis, and then push the fan module into the chassis as far as it can go until the captive screw makes contact with the chassis, and tighten the captive screw. To install a fan module in a Cisco Nexus 5596 chassis, see Figure 4-13. To install a fan module in a Cisco Nexus 5548 chassis, see Figure 4-14. To install a fan module in a Cisco Nexus 5020 chassis, see Figure 4-15. To install a fan module in a Cisco Nexus 5010 chassis, see Figure 4-16.

Figure 4-13 Installing a Fan Module in a Cisco Nexus 5596 Chassis

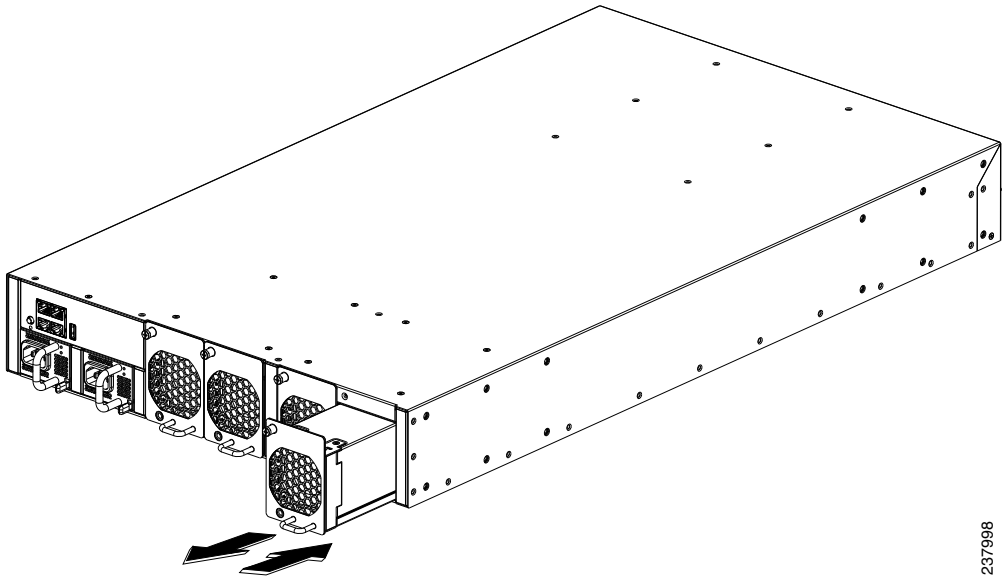

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Figure 4-14 Installing a Fan Module in a Cisco Nexus 5548 Chassis

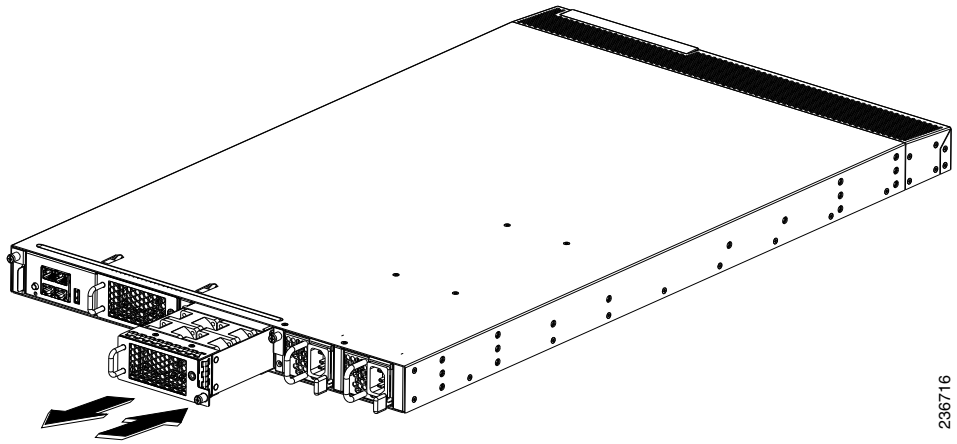

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Figure 4-15 Installing a Fan Module in a Cisco Nexus 5020 Chassis

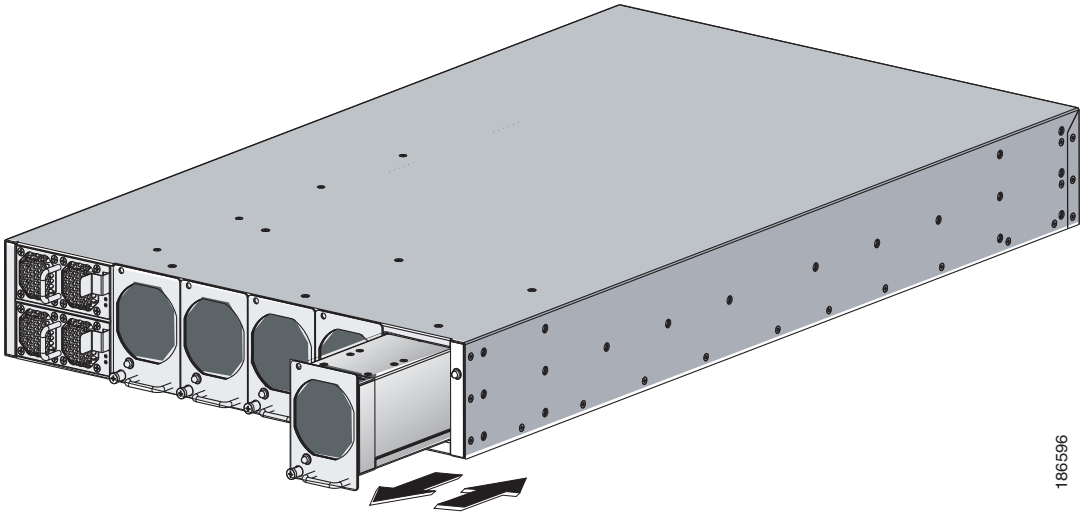
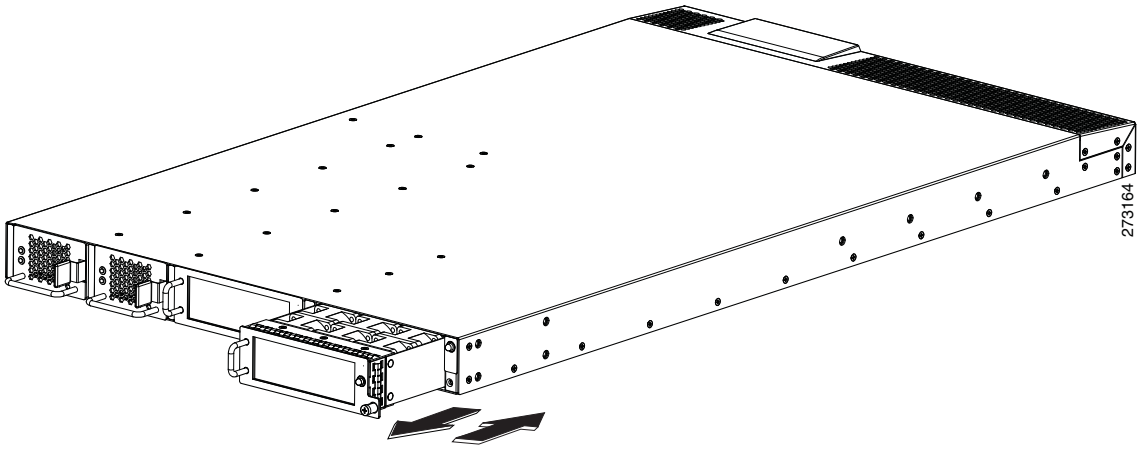


Figure 4-16 Installing a Fan Module in a Cisco Nexus 5010 Chassis



Step 3 If the switch is powered on, listen for the fans. You should immediately hear them operating. If you do not hear them, ensure that the fan module is inserted completely in the chassis and the faceplate of the module is flush with the outside surface of the chassis.

Step 4 Verify that the fan module LED is green. If the LED is not green, one or more fans are faulty. If this situation occurs, contact your customer service representative for one of the following replacement parts:

- Cisco Nexus 5596 fan modules (N5596UP-FAN=)
- Cisco Nexus 5548 fan modules (N5548P-FAN=)
- Cisco Nexus 5020 fan modules (N5K-C5020-FAN=)
- Cisco Nexus 5010 fan modules (N5K-C5010-FAN=)

Send documentation comments to nexus5kdocs@cisco.com.

Note If you purchased this product through a Cisco reseller, contact the reseller directly for technical support. If you purchased this product directly from Cisco, contact Cisco Technical Support at this URL: http://www.cisco.com/en/US/support/tsd_cisco_worldwide_contacts.html.

Removing the Cisco Nexus 5500 Platform Chassis or the Cisco Nexus 5000 Platform Chassis

Caution The slider rail and front rack-mount brackets do not have a stop mechanism when sliding in and out. If the front of the chassis is unfastened from the rack and the chassis slides forward on the slider rails, it might slip off the end of the rails and fall out of the rack.

To remove the Cisco Nexus 5500 Platform chassis or the Cisco Nexus 5000 Platform chassis from a rack, follow these steps:

Step 1 Ensure that the weight of the switch is fully supported and that the switch is being held by another person.

Step 2 Disconnect the power cord and the console cables.

Step 3 Disconnect all cables that are connected to SFP+ transceivers.

Step 4 Remove the screws fastening the front rack-mount brackets to the mounting rails.

Step 5 Gently slide the switch towards you, off of the slider rails and out of the rack.

Repacking Cisco Nexus 5500 Platform Switch Components or Cisco Nexus 5000 Platform Switch Components for Return Shipment

If you need to return the switch, remove the switch from the rack by following the steps in the "Removing the Cisco Nexus 5500 Platform Chassis or the Cisco Nexus 5000 Platform Chassis" section on page 4-17, and repack it for shipment. If possible, use the original packing materials and container to repack the switch. Contact your Cisco customer service representative to arrange for return shipment to Cisco.

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APPENDIX A

Cabinet and Rack Installation

This appendix provides the requirements for cabinet and rack installation for the Cisco Nexus 5500 Platform switch or the Cisco Nexus 5000 Platform switch and includes the following sections:

- Cabinet and Rack Requirements, page A-1
- Cable Management Guidelines, page A-2

Cabinet and Rack Requirements

This section provides the requirements for the following types of cabinets and racks, assuming an external ambient air temperature range of 0 to 104ºF (0 to 40ºC):

- Standard perforated cabinets
- Standard open racks

Note If you are selecting an enclosed cabinet, we recommend one of the thermally validated types: standard perforated or solid-walled with a fan tray.

Note Do not use racks that have obstructions (such as power strips), because the obstructions could impair access to field-replaceable units (FRUs).

This section includes the following topics:

- General Requirements for Cabinets and Racks, page A-1
- Requirements Specific to Perforated Cabinets, page A-2

General Requirements for Cabinets and Racks

The cabinet or rack must be one of the following types:

- Standard 19-in. (48.3 cm) (four-post EIA cabinet or rack, with mounting rails that conform to English universal hole spacing per section 1 of ANSI/EIA-310-D-1992. See the "Requirements Specific to Perforated Cabinets" section on page A-2.

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The cabinet or rack must also meet the following requirements:

- The minimum vertical rack space for the Cisco Nexus 5596 chassis and Cisco Nexus 5020 chassis must be two RU (rack units), equal to 3.50 inches (8.9 cm).
- The minimum vertical rack space for the Cisco Nexus 5548 chassis and Cisco Nexus 5010 chassis must be one RU (rack unit), equal to 1.75 inches (4.4 cm).
- The width between the rack-mounting rails must be at least 17.75 inches (45.1 cm) if the rear of the switch is not attached to the rack. For four-post EIA racks, this is the distance between the two front rails.
- For four-post EIA cabinets (perforated or solid-walled), the requirements are as follows:
  - The minimum spacing for the bend radius for fiber-optic cables should have the front-mounting rails of the cabinet offset from the front door by a minimum of 3 inches (7.6 cm), and a minimum of 5 inches (12.7 cm) if cable management brackets are installed on the front of the chassis.
  - The distance between the outside face of the front mounting rail and the outside face of the back mounting rail should be 23.5 to 34.0 inches (59.7 to 86.4 cm) to allow for rear-bracket installation.
  - A minimum of 2.5 inches (6.4 cm) of clear space should exist between the side edge of the chassis and the side wall of the cabinet. No sizeable flow obstructions should be immediately in the way of chassis air intake or exhaust vents.

Note Optional jumper power cords are available for use in a cabinet. See the "Jumper Power Cord" section on page C-9.

Requirements Specific to Perforated Cabinets

A perforated cabinet is as a cabinet with perforated front and rear doors and solid side walls. In addition to the requirements listed in the "General Requirements for Cabinets and Racks" section on page A-1, perforated cabinets must meet the following requirements:

- The front and rear doors must have at least a 60 percent open area perforation pattern, with at least 15 square inches (96.8 square cm) of open area per rack unit of door height.
- The roof should be perforated with at least a 20 percent open area.
- The cabinet floor should be open or perforated to enhance cooling.

Cisco provides an R-Series rack that conforms to these requirements.

Cable Management Guidelines

To help with cable management, you might want to allow additional space in the rack above and below the chassis to make it easier to route as many as 56 fiber or copper cables through the rack.

APPENDIX B

Technical Specifications

This appendix describes the technical specifications for the Cisco Nexus 5500 Platform switches and the Cisco Nexus 5000 Platform switches.

This appendix includes the following sections:

- Switch Specifications, page B-1
- Environmental Specifications, page B-2
- Expansion Module Specifications, page B-3
- Power Specifications, page B-3
- Transceiver Specifications, page B-6

Note Specifications for cables and connectors are provided in Appendix C, "Cable and Port Specifications."

Switch Specifications

Table B-1 lists the physical specifications for the Cisco Nexus 5596 switch.

Table B-1 Physical Specifications for the Cisco Nexus 5596 Switch

Description	Specification
Dimensions (H x W x D)	3.47 in. x 17.3 in. x 29.5 in. (8.8 x 43.9 x 74.9 cm)
Weight (with two power supplies, one expansion module, and four fan modules)	50 lb (22.68 kg)

Table B-2 lists the physical specifications for the Cisco Nexus 5548 switch.

Table B-2 Physical Specification for the Cisco Nexus 5548 Switch

Description	Specification
Dimensions (H x W x D)	1.72 in. x 17.3 in. x 29.5 in. (4.4 x 43.9 x 74.9 cm)
Weight (with two power supplies, one expansion module, and two fan modules)	32 lb (14.51 kg)

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Table B-3 lists the physical specifications for the Cisco Nexus 5020 switch.

Table B-3 Physical Specification for the Cisco Nexus 5020 Switch

Description	Specification
Dimensions (H x W x D)	3.47 in. (8.8 cm) x 17.3 in. (43.9 cm) x 30.0 in. (76.2 cm)
Weight (with two power supplies and two expansion modules installed)	50 lb (22.680 kg)

Table B-4 lists the physical specifications for the Cisco Nexus 5010 switch.

Table B-4 Physical Specification for the Cisco Nexus 5010 Switch

Description	Specification
Dimensions (H x W x D)	1.72 in. x 17.3 in. (43.9 cm) x 30.0 in. (76.2 cm)
Weight (with two power supplies and one expansion module installed)	35 lb (15.875 kg)

Environmental Specifications

Table B-5 lists the environmental specifications for the Cisco Nexus 5500 Platform switches.

Table B-5 Environmental Specifications for the Cisco Nexus 5500 Platform Switches

Property	Cisco Nexus 5596 Switch	Cisco Nexus 5548 Switch
Operating temperature	32 to 104°F (0 to 40°C)	32 to 104°F (0 to 40°C)
Nonoperating (storage) temperature	–40 to 158°F (–40 to 70°C)	–40 to 158°F (–40 to 70°C)
Humidity	5 to 95% (noncondensing)	5 to 95% (noncondensing)
Altitude	0 to 10,000 ft (0 to 300 m)	0 to 10,000 ft (0 to 300 m)

Table B-6 lists the environmental specifications for the Cisco Nexus 5000 Platform switches.

Table B-6 Environmental Specifications for the Cisco Nexus 5000 Platform Switches

Property	Cisco Nexus 5020 Switch	Cisco Nexus 5010 Switch
Operating temperature	32 to 104°F (0 to 40°C)	32 to 104°F (0 to 40°C)
Nonoperating (storage) temperature	–40 to 158°F (-40 to 70°C)	–40 to 158°F (–40 to 70°C)
Humidity	5 to 95% (noncondensing)	5 to 95% (noncondensing)
Altitude	0 to 10,000 ft (0 to 300 m)	0 to 10,000 ft (0 to 300 m)

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Expansion Module Specifications

Table B-7 lists the physical specifications for the Cisco Nexus 5020 switch expansion module.

Table B-7 Physical Specifications for the Cisco Nexus 5020 Switch Expansion Modules

Description	Specification
Weight	1 lb (0.5 kg)

Power Specifications

This section describes the power specifications for the Cisco Nexus 5000 Series switches. This section includes the following topics:

- Specifications for the Cisco Nexus 5596 Power Supply, page B-3
- Specifications for the Cisco Nexus 5548 Power Supply, page B-4
- Specifications for the Cisco Nexus 5020 Power Supplies, page B-5
- Specifications for the Cisco Nexus 5010 Power Supply, page B-5

Specifications for the Cisco Nexus 5596 Power Supply

Table B-8 lists the specifications for the Cisco Nexus 5596 1100W AC power supply.

Table B-8 Specifications for the Cisco Nexus 5596 1100W AC Power Supply

AC Power Supply Properties	Specification
Typical operating power	680 W
Maximum power	1079 W
Add Input Current	14A/6A
Input voltage	100 to 240 VAC
Frequency	50 to 60 Hz
Efficiency	95 to 98% (50 to 100% load)
RoHS compliance	Yes
Hot swappable	Yes
Heat dissipation	75 BTU/hr

Table B-9 lists the specifications for the Cisco Nexus 5596 1100W DC Power Supply

Table B-9 Specifications for the Cisco Nexus 5596 1100W DC Power Supply

AC Power Supply Properties	Specification
Typical operating power	680W
Maximum power	1079 W

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Table B-9 Specifications for the Cisco Nexus 5596 1100W DC Power Supply

AC Power Supply Properties	Specification
Input voltage	–40 to –72 VDC
Frequency	N/A
Efficiency	88%
RoHS compliance	Yes
Hot swappable	Yes
Heat dissipation	450 BTU/hr

Specifications for the Cisco Nexus 5548 Power Supply

Table B-10 lists the specifications for the Cisco Nexus 5548 750W DC power supply.

Table B-10 Specifications for the Cisco Nexus 5548 750 W DC Power Supply

DC Power Supply Properties	Specification
Typical operating power	390W
Maximum power	680W
Input current	22A/12.5A
Input voltage	–40 to –72 VDC
Frequency	N/A
Efficiency	88%
RoHS compliance	Yes
Hot swappable	Yes
Heat Dissipation	307 BTU/hr

Table B-11 lists the specifications for the Cisco Nexus 5548 750W AC Ppower supply.

Table B-11 Specifications for the Cisco Nexus 5548 750W AC Power Supply

AC Power Supply Properties	Specification
Typical operating power	390 W
Maximum power	680 W
input current	10A/3.75A
Input voltage	100 to 240 VAC
Frequency	50 to 60 Hz
Efficiency	95 to 98% (50 to 100% load)
RoHS compliance	Yes
Hot swappable	yes
Heat dissipation	51 BTU/hr

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Specifications for the Cisco Nexus 5020 Power Supplies

Table B-12 lists the specifications for the Cisco Nexus 5020 750 W AC power supply.

Table B-12 Specifications for the Cisco Nexus 5020 750 W AC Power Supply

Description	Specification
Typical Operating Power	480 W (Typical)
Max Power (system)	750 W
Input Voltage	100–120 V/200–240 V
Input Current	9.2 A/4.5 A
Frequency	50–60 Hz
RoHS Compliance	Yes
Hot Swappable	Yes
Heat Dissipation	51 BTU/hr
Dimensions (H x W x D)	1.57 in. (0.039 m) x 4.00 in. (0.101 m) x 13.00 in. (0.330 m)

Table B-13 lists the specifications for the Cisco Nexus 5020 1200 W power supply.

Table B-13 Specifications for the Cisco Nexus 5020 1200 W Power Supply

Description	Specification
Typical Operating Power	480 W (Typical)
Max Power (system)	750 W
Input Voltage	100–120 V/200–240 V
Input Current	9.2 A/7.5 A
Frequency	50–60 Hz
RoHS Compliance	Yes
Hot Swappable	Yes
Heat Dissipation	491 BTU/hr
Dimensions (H x W x D)	1.57 in. (0.039 m) x 4.00 in. (0.101 m) x 13.00 in. (0.330 m)

Specifications for the Cisco Nexus 5010 Power Supply

The power supplies connect to the system through panel mount connectors and connectors attach to the baseboard through cables. Three connectors on the baseboard: two for power delivery, and one for power supply control signals. Table B-14 lists the specifications for the Cisco Nexus 5010 550 W AC power supply.

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Table B-14 Specifications for the Cisco Nexus 5010 550W AC Power Supply

Description	Specification
Typical Operating Power	340W
Max Power (system)	410W
Input voltage	90–264 VAC
Add input current	7.3A/2.75A
Frequency	47–63 Hz
ROHS Compliant	Yes
Size (W x H x D)	2.75 in. x 1.57 in. x 13.7 in.
Hot plug capable	Yes
Hot swappable	Yes
Heat Dissipation	1536 BTU/hr

Transceiver Specifications

Table B-15 lists the general specifications for the 10-Gigabit Ethernet SFP+ transceiver module for the Cisco Nexus 5500 Platform switches and the Cisco Nexus 5000 Platform switches.

Table B-15 General Specifications for the 10-Gigabit Ethernet SFP+ Transceiver Module

Description	Short Range	
Connector type	LC	—
Wavelength	850 nm	—
Core size	50 microns	62.5 microns
Cable distance	300 m	33 m

This section includes the following topics:

- Environmental Conditions and Power Requirement Specifications for SFP+ Transceivers, page B-6
- General Specifications for Cisco Fibre Channel SFP Transceivers, page B-7
- Environmental Conditions and Power Requirements Specification for SFP Transceivers, page B-7

Environmental Conditions and Power Requirement Specifications for SFP+ Transceivers

Table B-16 lists the environmental conditions and power requirement specifications for the 10-Gigabit Ethernet SFP+ transceiver module for the Cisco Nexus 5500 Platform switches and Cisco Nexus 5000 Platform switches.

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Table B-16 Environmental Conditions and Power Requirement Specifications for the 10-Gigabit Ethernet SFP+ Transceiver Module

Parameter	Symbol	Minimum	Maximum	Unit
Storage temperature	T_s	–40	—	ºC
Case temperature	T_c	0	70	ºC
Relative humidity	RH	—	—	—
Module supply voltage	V_{cc}T,R	3.1	3.5	V

General Specifications for Cisco Fibre Channel SFP Transceivers

Table B-17 lists the general specifications for Cisco Fibre Channel SFP transceivers at 4 Gbps for the Cisco Nexus 5500 Platform switches and the Cisco Nexus 5000 Platform switches.

Table B-17 General Specifications for Cisco Fibre Channel SFP Transceivers at 4 Gbps

Description	Short Wavelength	
Connector type	LC	—
Wavelength	850 nm	—
Fibre type	MMF	—
Core size	50 microns	62.5 microns
Cable distance[1]	328.08 yd (300 m)	164.04 yd (150 m)
Transmit power	–9 to –2.5 dBM	

1. Approximate; actual distance may vary depending on fiber quality and other factors.

Environmental Conditions and Power Requirements Specification for SFP Transceivers

Table B-18 provides the maximum environmental and electrical ratings for Cisco Fibre Channel SFP transceivers for the Cisco Nexus 5500 Platform switches and Cisco Nexus 5000 Platform switches.

Table B-18 Environmental Conditions and Power Requirements Specifications for SFP Transceivers

Parameter	Symbol	Minimum	Maximum	Unit
Storage temperature[1]	T_s	–40	85	ºC
Case temperature[1],[2]	T_c	0	70	ºC
Relative humidity[1]	RH	5	95	%
Module supply voltage[1]	V_{cc}T,R	3.1	3.5	V

1. Absolute maximum ratings are those values beyond which damage to the device may occur if these limits are exceeded for other than a short period of time.

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2. Functional performance is not intended, device reliability is not implied, and damage to the device may occur over an extended period of time between absolute maximum ratings and the recommended operating conditions.

APPENDIX C

Cable and Port Specifications

This appendix provides cable and port specifications for all of the Cisco Nexus 5000 Series switches.

This appendix includes the following sections:

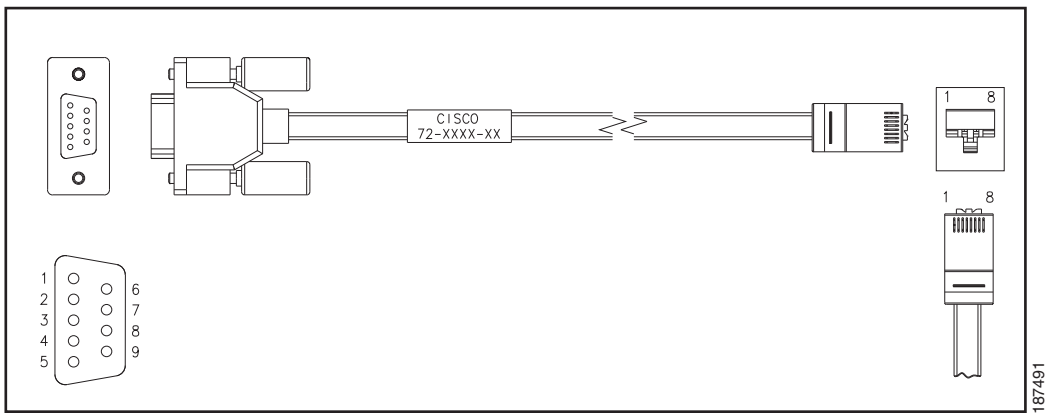
- Console Port, page C-2
- Supported Power Cords and Plugs, page C-3
- Jumper Power Cord, page C-9

Console Cable

Note This section applies to the Cisco Nexus 5000 Series switches.

The console cable has a RJ-45, RS-232 connector on one end and a DB9 connector on the other end. See Figure C-1.

Figure C-1 Console Cable



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Cable RJ-45 Connector Pinouts

Table C-1 lists the pinouts for the RJ-45 connector on the console cable.

Table C-1 Cable Connector Pinouts

Signal Name	P1, P1-45 Pins	P2, DB-9 Pins	Signal Name
RTS	1	8	CTS
DTR	2	6	DSR
TXD	3	2	ZXD
GND	4	5	GND
GND	5	5	GND
ZXD	6	3	TXD
DSR	7	4	DTR
CTS	8	7	RTS

Console Port

Note This section applies to the Cisco Nexus 5500 Platform switches and the Cisco Nexus 5000 Platform switches.

The console port is an asynchronous RS-232 serial port with an RJ-45 connector.

Console Port Pinouts

Table C-2 lists the pinouts for the console port on the Cisco Nexus 5548 switch and the Cisco Nexus 5020 switch.

Table C-2 Console Port Pinouts for the Cisco Nexus 5548 Switch and the Cisco Nexus 5020 Switch

Pin	Signal
1	RTS
2	DTR
3	TxD
4	GND
5	GND
6	RxD
7	DSR
8	CTS

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Table C-3 lists the pinouts for the console port on the Cisco Nexus 5010 switch.

Table C-3 Console Port Pinouts for the Cisco Nexus 5010 Switch

Pin	Signal
1	RTS
2	DTR
3	TxD
4	GND
5	GND
6	RxD
7	DSR
8	CTS

Supported Power Cords and Plugs

Note This section applies to the Cisco Nexus 5548 switch, the Cisco Nexus 5020 switch, and the Cisco Nexus 5010 switch.

Each power supply has a separate power cord. Standard power cords or jumper power cords are available for connection to a power distribution unit that has IEC 60320 C19 outlet receptacles. The standard power cords have an IEC C13 connector on the end that plugs into the switch. The optional jumper power cords, for use in cabinets, have an IEC C13 connector on the end that plugs into the switch and an IEC C14 connector on the end that plugs into an IEC C13 outlet receptacle.

Note Only the regular power cords or jumper power cords provided with the switch are supported.

Table C-4 lists the power cords for the Cisco Nexus 5020 switch and provides their lengths in feet and meters.

Table C-4 Power Cords for the Cisco Nexus 5020 Switch

Description	Length		Power Cord Reference Illustration
	Feet	Meters	
SFS-250V-10A-AR Power cord 250 VAC 10 A, IRAM 2073 plug Argentina	8.2	2.5	Figure C-2
CAB-9K10A-AU Power cord 250 VAC 10 A, 3112 plug, Australia	8.2	2.5	Figure C-3
SFS-250V-10A-CN Power cord 250 VAC 10 A, GB 2009 plug China	8.2	2.5	Figure C-4

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Table C-4 Power Cords for the Cisco Nexus 5020 Switch (continued)

Description	Length		Power Cord Reference Illustration
	Feet	Meters	
CAB-9K10A-EU Power cord, 250 VAC 10 A, M 2511 plug Europe	8.2	2.5	Figure C-5
SFS-250V-10A-ID Power cord 250 VAC 16A, EL-208 plug South Africa, United Arab Emerits, India	8.2	2.5	Figure C-6
SFS-250V-10A-IS Power cord 250 VAC 10 A, SI-32 plug Israel	8.2	2.5	Figure C-7
CAB-9K10A-IT Power cord 250 VAC 10 A, CEI 23-16 plug Italy	8.2	2.5	Figure C-8
CAB-9K10A-SW Power cord 250 VAC 10 A, MP232 plug Switzerland	8.2	2.5	Figure C-9
CAB-9K10A-UK Power cord 250 VAC 10 A, BS1363 plug (13 A fuse) United Kingdom	8.2	2.5	Figure C-10
CAB-AC-250V/13A Power cord 250 VAC 13 A, NEMA L6-20 plug North America	6.6	2.0	Figure C-11
CAB-N5K6A-NA Power cord 250 VAC 10 A, NEMA 6-15 plug North America	8.2	2.5	Figure C-12
CAB-9K12A-NA Power cord 125 VAC 13 A, NEMA 5-15 plug North America	8.2	2.5	Figure C-13
CAB-C13-CBN Power cord 250 VAC 10 A, SS 10A plug	8.2	2.5	Figure C-14
CAB-IND-10A Power cord 250 VAC 10 A, EL 208B plug	8.2	2.5	Figure C-15
CAB-C13-C14-JMPR Cabinet Jumper Power Cord 250 VAC 13 A, C13-C14 Connectors	2.2	0.7	Figure C-16

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Figure C-2 SFS-250V-10A-AR

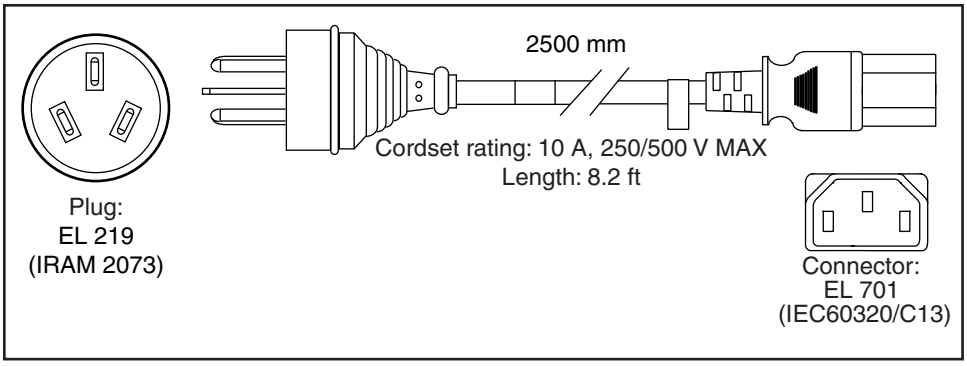

Figure C-3 CAB-9K10A-AU

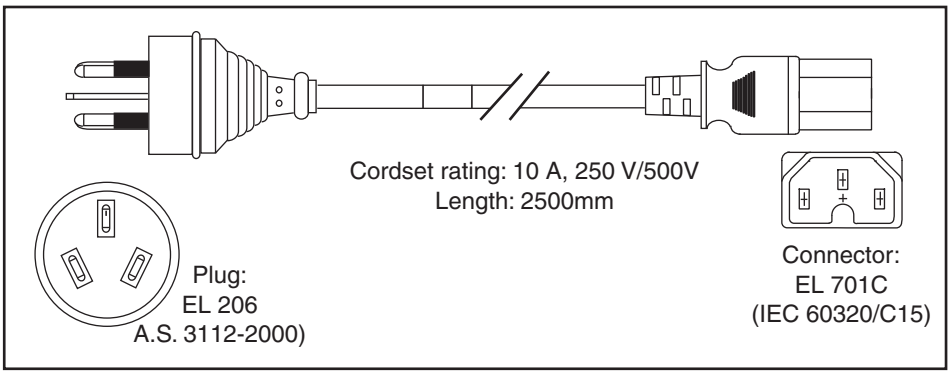

Figure C-4 SFS-250V-10A-CN

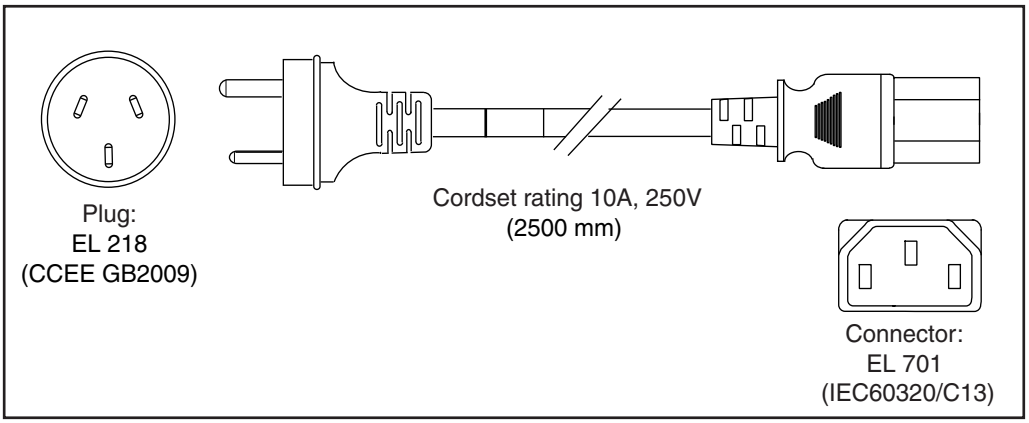

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Figure C-5 CAB-9K10A-EU

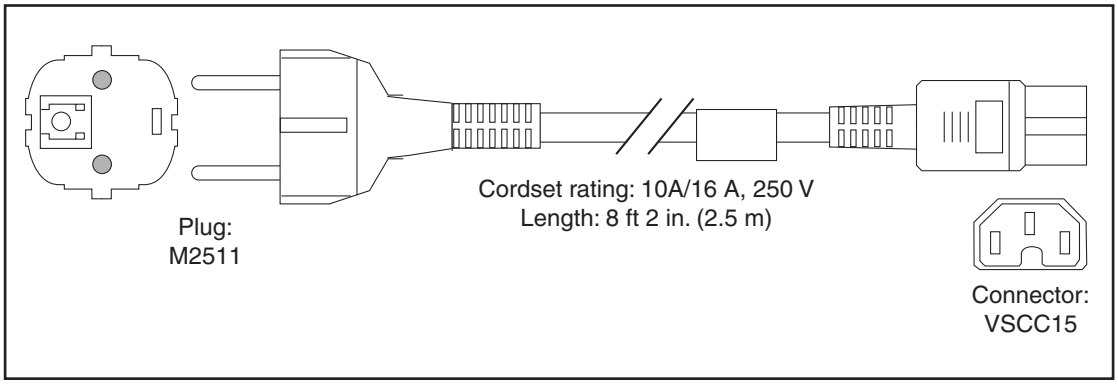

Figure C-6 SFS-250V-10A-ID

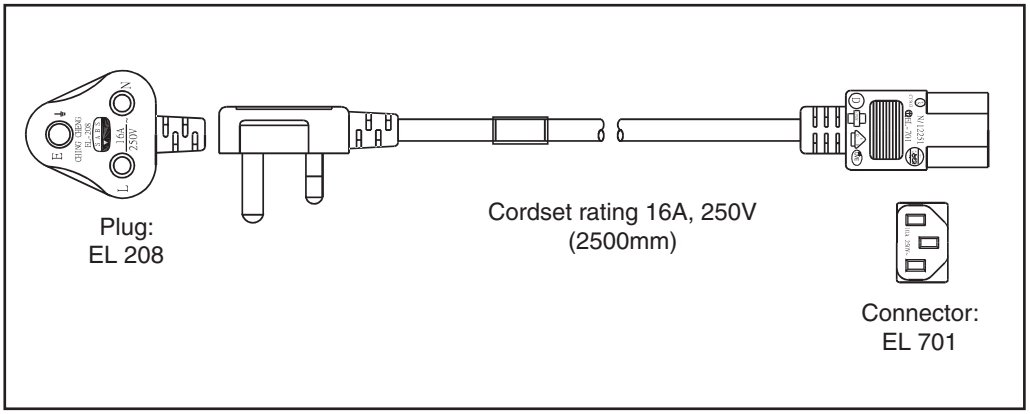

Figure C-7 SFS-250V-10A-IS

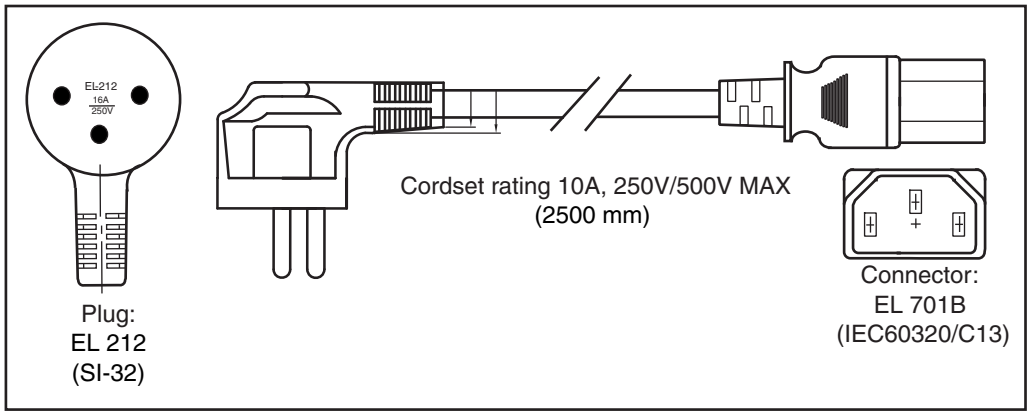

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Figure C-8 CAB-9K10A-IT

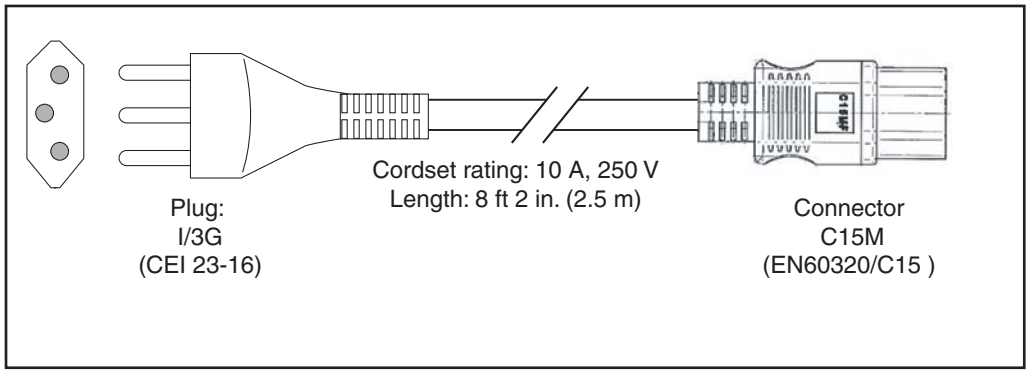

Figure C-9 CAB-9K10A-SW

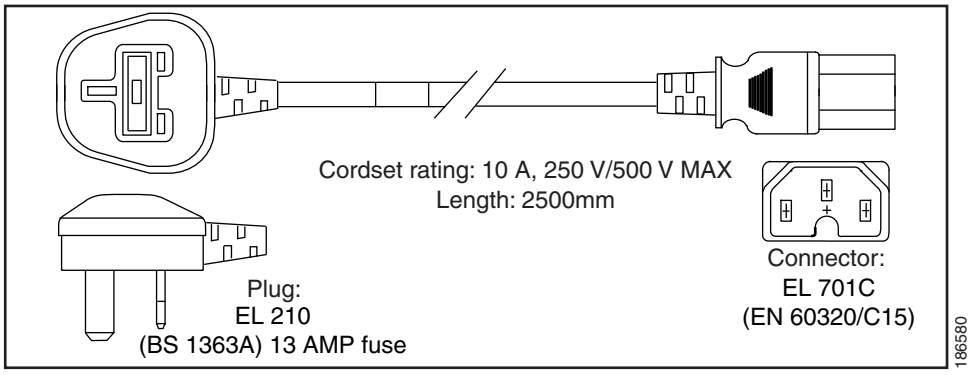

Figure C-10 CAB-9K10A-UK

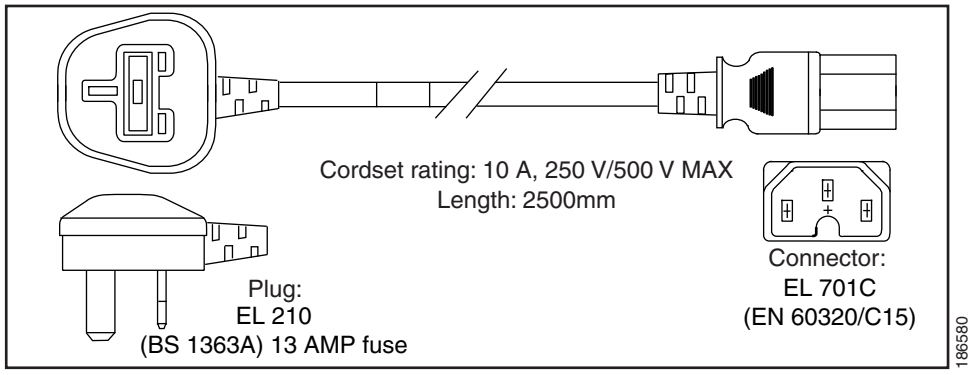

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Figure C-11 CAB-AC-250V/13A

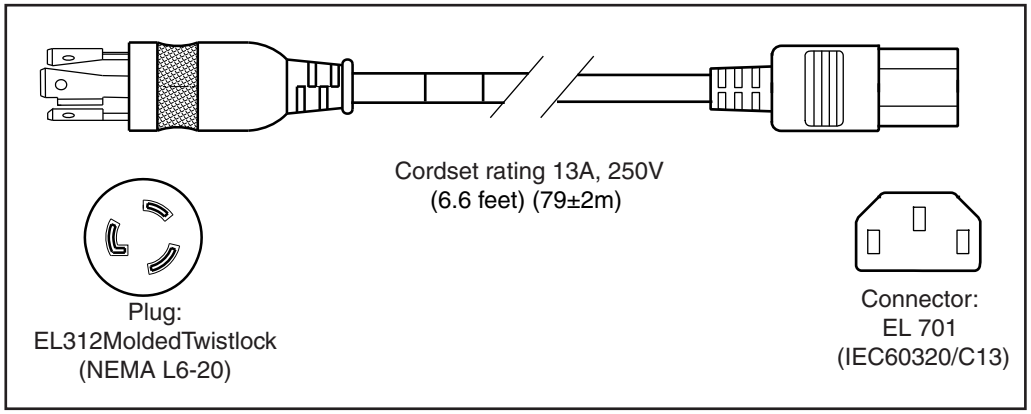

Figure C-12 CAB-N5K6A-NA

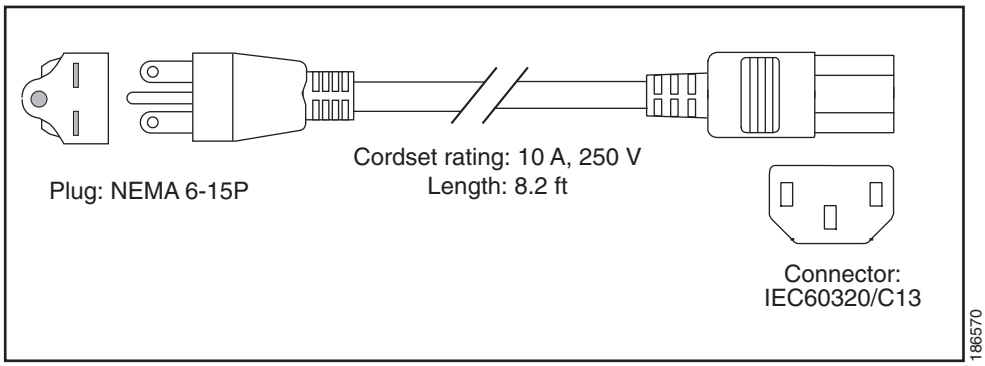

Figure C-13 CAB-9K12A-NA

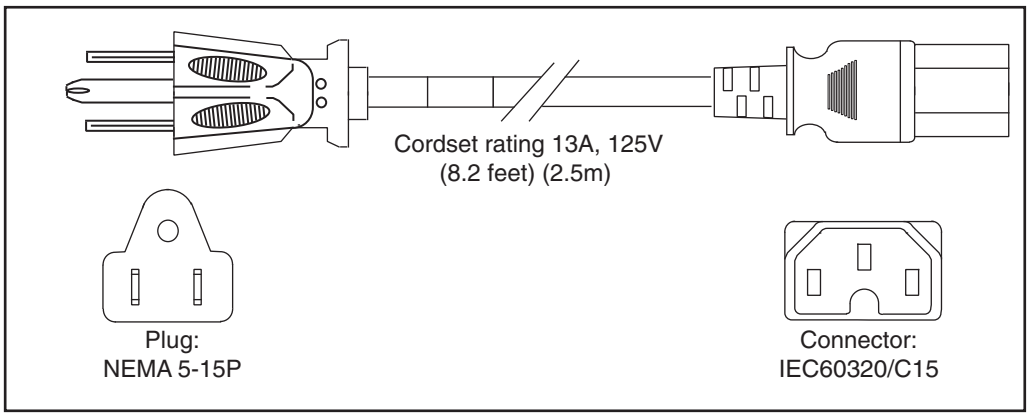

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Figure C-14 CAB-C13-CBN

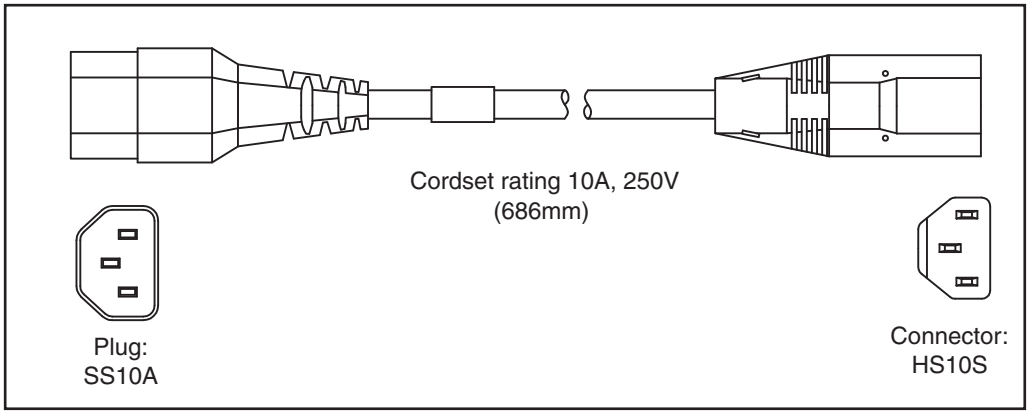
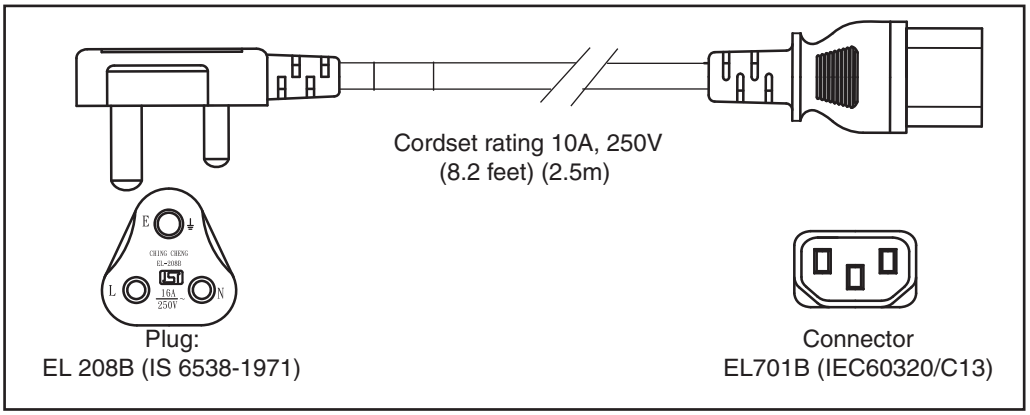


Figure C-15 CAB-IND-10A



Jumper Power Cord

Figure C-16 shows the plug connector on the optional jumper power cord for the Cisco Nexus 5000 Series switches. This cable plugs into the power supply, and the receptacle of a power distribution unit for a cabinet. This cable comes in 6- and 9-foot (2- and 3-meter) lengths.

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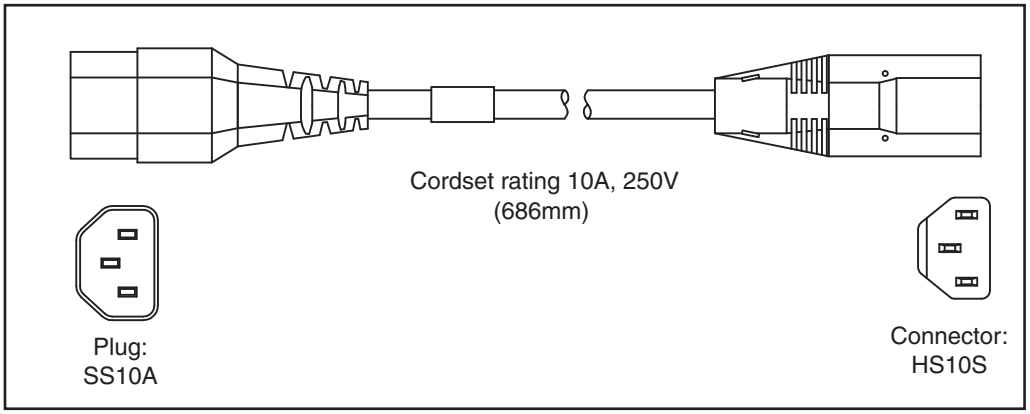
Figure C-16 CAB-C13-C14-JMPR, Jumper Power Cord



APPENDIX D

LEDs

This appendix describes the conditions indicated by the chassis and module LEDs on the Cisco Nexus 5000 Series switches.

This appendix includes the following sections:

- Chassis and Module LEDs for the Cisco Nexus 5000 Series Switches, page D-1
- Port LEDs, page D-4

Chassis and Module LEDs for the Cisco Nexus 5000 Series Switches

This section includes the following topics:

- Chassis and Module LED Descriptions, page D-2
- Conditions Indicated by the Power Supply LEDs, page D-3

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Chassis and Module LED Descriptions

Table D-1 describes the chassis LEDs for the Cisco Nexus 5000 Series switches.

Table D-1 LEDs for the Cisco Nexus 5500 Platform Switches

Component	LED	Status	Description
Chassis (front and back)	ID (Cisco Nexus 5500 Platform only)	On (blue)	Identifies the chassis receiving the beacon signal.
	Status	Solid on (green)	All diagnostics pass. The module is operational.
		Off	The module is not receiving power.
		On (amber)	The module is booting or running diagnostics. An overtemperature condition has occurred. The temperature threshold has been exceeded by a small value during environmental monitoring.
		Blinking (amber)	An overtemperature condition has occurred. The temperature threshold has been exceeded by a large value during environmental monitoring. If the module fails during initial reset, the LED continues to blink and the module does not come online. The module has a runtime failure and is brought offline.
Fan tray (front of chassis)	Status	Solid on (green)	All diagnostics pass. The module is operational.
		Off	The module is not receiving power.
		Solid on (amber)	The module is booting or running diagnostics.
		Blinking (amber)	If the module fails during initial reset, the LED continues to blink and the module does not come online. The module has runtime failure and is brought offline.
Power supply (front of chassis)	OK (green)	Solid on	Power supply is on and okay.
		Blinking	3.3 voltage standby (VSB) is on but the power supply unit is not powering the other modules.
		Off	No AC power to the power supply.
	FAULT (amber)	Solid on	Power supply failures, overvoltage, overcurrent, overtemperature.
		Blinking	AC is present, 3.3 VSB on, and the power supply is off.
		Off	Operating normally.

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Table D-1 LEDs for the Cisco Nexus 5500 Platform Switches (continued)

Component	LED	Status	Description
Expansion module	Status	On (green)	All diagnostics pass. The module is operational.
		Off	The module is not receiving power.
		Solid on (amber)	The module is booting or running diagnostics. An overtemperature condition has occurred. The temperature threshold has been exceeded by a small value during environmental monitoring.
		Blinking (amber)	An overtemperature condition has occurred. The temperature threshold has been exceeded by a large value during environmental monitoring. If the module fails during initial reset, the LED continues to blink and the module does not come online. The module has runtime failure and is brought offline.
Port LED	Indicates LED status	Off	The port is not active or the link is not connected.
		Solid on (green)	The port is active. The link is connected and operational.
		Solid on (amber)	The module or port is disabled through the CLI command or the module is initializing.
		Blinking (amber)	The port is faulty and has been disabled.

Table D-2 table describes the status of the two power supply LEDs

Conditions Indicated by the Power Supply LEDs

You can determine the power supply conditions by combining the LED states of the OK and FAIL LEDs (see Table D-2).

Table D-2 Power Supply LED Descriptions

Power Supply Condition	OK LED (Green)	FAIL LED (Amber)
No AC or DC power to all power supplies.	Off	Off
Power supply failure, including over voltage, over current, over temperature, and fan failure.	Off	On
Power supply warning events where the power supply continues to operate. These events include high temperature, high power, and slow fan.	Off	Blinking

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Table D-2 Power Supply LED Descriptions (continued)

Power Supply Condition	OK LED (Green)	FAIL LED (Amber)
AC present, 3.3 voltage standby (VSB) on, and the power supply unit is off. For a DC power supply, it indicates that DC power is present.	Blinking	Off
Power supply on and OK.	On	Off

Port LEDs

This section includes the following topics:

- Ethernet Port LEDs, page D-4
- Ethernet and Fibre Channel LEDs, page D-4

Ethernet Port LEDs

Table D-3 lists the LED descriptions for the RJ-45 Ethernet port LEDs.

Table D-3 Ethernet Port LED Descriptions

LED	Status	Description
Left	Off	No link
	Solid green	Physical link
Right	Off	No activity
	Blinking green	Activity

Ethernet and Fibre Channel LEDs

There are 20 to 26 port activity LEDs on the switch depending on whether the GEM is a Fibre Channel or 10-Gigabit Ethernet module. Table D-4 describes the behavior of the port LEDs.

Table D-4 Port-Level LEDs

Link State	LED State	Notes
Link Down	OFF	—
POST failed on port	AMBER blinking yellow	—
Administrative disabled	AMBER_ON	Depending on the product you look at, the LED could be off, or solid amber
Link Up, port in STP forwarding state	GREEN_ON	Blinks based on network activity

APPENDIX E

Troubleshooting Hardware Components

This appendix describes how to identify and resolve problems that might occur with the hardware components of a Cisco Nexus 5000 Series switch.

This appendix includes the following sections:

- Overview, page E-1
- SNMP Traps, page E-1
- Switch Hardware Best Practices, page E-2
- Power Supply Conditions, page E-2

Overview

The key to success when troubleshooting the system hardware is to isolate the problem to a specific system component. The first step is to compare what the system is doing to what it should be doing. Because a startup problem can usually be attributed to a single component, it is more efficient to isolate the problem to a subsystem rather than troubleshoot each separate component in the system.

Problems with the initial power up are often caused by a module that is not firmly connected to the backplane or a power supply that has been disconnected from the power cord connector.

Overheating can also cause problems with the system, though typically only after the system has been operating for an extended period of time. The most common cause of overheating is the failure of a fan module.

SNMP Traps

You can set SNMP traps to monitor fans, power supplies, and temperature settings, or to test a call home application. Use the following commands to set SNMP traps:

- **test pfmtest-SNMP-trap fan**
- **test pfmtest-SNMP-trap power supply**
- **test pfmtest-SNMP-trap temp-sensor**

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Switch Hardware Best Practices

Use the recommendations in this section to ensure the proper installation, initialization, and operation of the switch.

This section includes the following topics:

- Installation Best Practices, page E-2
- Initialization Best Practices, page E-2
- Switch Operation Best Practices, page E-2

Installation Best Practices

When installing the switch, follow these best practices:

- Plan your site configuration and prepare the site before installing the chassis.
- Verify that you have the appropriate power supplies for your chassis configuration.
- Install the chassis following the rack and airflow guidelines presented in this guide.
- Verify that the chassis is adequately grounded.

Initialization Best Practices

When the initial system boot is complete, verify the following:

- Power supplies are supplying power to the system.
- Fan modules are operating normally.
- The system software boots successfully.

Switch Operation Best Practices

To ensure proper operation of your switch, take the following actions:

- Make a copy of the running configuration to CompactFlash for a safe backup.
- Always enter the **copy running-config startup-config** CLI command after you modify the running configuration and ensure that the system is operating properly.
- Never use the **init system** CLI command unless you understand that you will lose the running and startup configuration as well as the files stored on bootflash:.
- Keep backup copies of the running kickstart and the system images on CompactFlash.

Power Supply Conditions

The two LEDs on each power supply indicate the power status for each power supply. To determine the current status for a power supply unit, note which LED is on, blinking, or off and refer to Table E-1.

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Table E-1 Power Supply Conditions

Power Supply Condition	Power LED Status	Fail LED Status
No power to all power supplies.	Off	Off
Power supply failure, including overvoltage, overcurrent, overtemperature, and fan failure.	Off	On
Power supply warning events where the power supply continues to operate. These events include high temperature, high power, and slow fan.	Off	Blinking
AC present, 3.3 voltage standby (VSB) on, and the power supply unit is off.	Blinking	Off
Power supply on and OK.	On	Off

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APPENDIX F

Accessory Kits

This appendix describes the contents of the accessory kits for each of the Cisco Nexus 5000 Series switches.

This appendix includes the following sections:

- Cisco Nexus 5596UP and 5596T Switch Accessory Kit, page F-1
- Cisco Nexus 5548UP and Cisco Nexus 5548P Switch Accessory Kit, page F-1
- Cisco Nexus 5020 Switch Accessory Kit, page F-2
- Cisco Nexus 5010 Switch Accessory Kit, page F-2

Cisco Nexus 5596UP and 5596T Switch Accessory Kit

This section describes the accessory kit contents for the Cisco Nexus 5596UP and the Cisco Nexus 5596T switches.

The Cisco Nexus 5596UP and Cisco Nexus 5596T switch accessory kit includes the following items:

- 2 slider rails
- 2 rack-mount guides
- 2 rack-mount brackets
- 16 M4 x 0.7 x 8-mm Phillips countersunk screws
- 1 console cable with an RJ-45-RS-232 adapter and a DB9 adapter
- 1 ground lug kit
- 1 ESD wrist strap

Note Additional parts can be ordered from your customer service representative.

Cisco Nexus 5548UP and Cisco Nexus 5548P Switch Accessory Kit

This section describes the accessory kit contents for the Cisco Nexus 5548 switches.

The Cisco Nexus 5548 switch accessory kit includes the following items:

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- 2 slider rails
- 2 rack-mount guides
- 2 rack-mount brackets
- 12 M4 x 0.7 x 8-mm Phillips countersunk screws
- 1 console cable with an RJ-45-RS-232 adapter and a DB9 adapter
- 1 ground lug kit
- 1 ESD wrist strap

Note Additional parts can be ordered from your customer service representative.

Cisco Nexus 5020 Switch Accessory Kit

This section describes the accessory kit contents for the Cisco Nexus 5020 switch and describes how to attach a power cord to the switch.

The Cisco Nexus 5020 switch accessory kit includes the following items:

- 2 slider rails
- 2 rack-mount guides
- 2 rack-mount brackets
- 16 M4 x 0.7 x 8-mm Phillips countersunk screws
- 1 console cable with an RJ-45-RS-232 adapter and a DB9 adapter
- 1 ground lug kit
- 1 ESD wrist strap
- 8 power cord clips (a wire clip that is used to retain the power cord).

Note Additional parts can be ordered from your customer service representative.

Cisco Nexus 5010 Switch Accessory Kit

This section describes the accessory kit contents for the Cisco Nexus 5010 switch and describes how to attach a power cord to the switch.

The Cisco Nexus 5010 switch accessory kit includes the following items:

- 2 slider rails
- 2 rack-mount guides
- 2 rack-mount brackets
- 12 M4 x 0.7 x 8-mm Phillips countersunk screws
- 1 console cable with an RJ-45-RS-232 adapter and a DB9 adapter
- 1 ground lug kit
- 1 ESD wrist strap

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- 4 power cord clip (a wire clip that is used to retain the power cord).

Note Additional parts can be ordered from your customer service representative.

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APPENDIX G

Site Planning and Maintenance Records

This appendix provides log sheets that you can use to record information when installing a Cisco Nexus 5000 Series switch.

This appendix includes the following sections:

- Site Preparation Checklist, page G-1
- Contact and Site Information, page G-3
- Chassis and Module Information, page G-4

Note For information about how to query the switch for configuration information, see the appropriate Cisco Nexus 5000 Series CLI configuration guide.

Site Preparation Checklist

Planning the location and layout of your equipment rack or wiring closet is essential for successful switch operation, ventilation, and accessibility. Table G-1 lists the site planning tasks that we recommend completing before installing a Cisco Nexus 5000 Series switch.

Consider heat dissipation when sizing the air-conditioning requirements for an installation. See Table B-6 on page B-2 for the environmental requirements, and the "Power Specifications" section on page B-3 for power and heat ratings.

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Table G-1 Site Planning Checklist

Task No.	Planning Activity	Verified By	Time	Date
1	Space evaluation: • Space and layout • Floor covering • Impact and vibration • Lighting • Maintenance access			
2	Environmental evaluation: • Ambient temperature • Humidity • Altitude • Atmospheric contamination • Air flow			
3	Power evaluation: • Input power type • Power receptacles[1] • Receptacle proximity to the equipment • Dedicated circuit for power supply • Dedicated (separate) circuits for redundant power supplies • UPS[2] for power failures			
4	Grounding evaluation: • Circuit breaker size • CO ground (AC- powered systems)			
5	Cable and interface equipment evaluation: • Cable type • Connector type • Cable distance limitations • Interface equipment (transceivers)			
6	EMI[3] evaluation: • Distance limitations for signaling • Site wiring • RFI[4] levels			

1. Verify that the power supply installed in the chassis has a dedicated AC source circuit.
2. UPS = uninterruptible power supply.

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3. EMI = electromagnetic interference.
4. RFI = radio frequency interference.

Contact and Site Information

Use the following worksheet (Table G-2) to record contact and site information.

Table G-2 Contact and Site Information

Contact person	
Contact phone	
Contact e-mail	
Building/site name	
Data center location	
Floor location	
Address (line 1)	
Address (line 2)	
City	
State	
Zip code	
Country	

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Chassis and Module Information

Use the following worksheets (Table G-3 and Table G-4) to record information about the chassis and modules.

Contract Number_____

Chassis Serial Number_____

Product Number_____

Table G-3 Network-Related Information

Switch IP address	
Switch IP netmask	
Host name	
Domain name	
IP broadcast address	
Gateway/router address	
DNS address	
Modem telephone number	

Table G-4 Module Information

Slot	Module Type	Module Serial Number	Notes
1	Supervisor		
2			

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